

A1-F18AC-SRM-212

1 MAY 1999

TECHNICAL MANUAL

ORGANIZATIONAL, INTERMEDIATE AND DEPOT MAINTENANCE

STRUCTURE REPAIR WING

NAVY MODEL
F/A-18A AND F/A-18B
161353 AND UP

This volume is one of three volumes and is incomplete without A1-F18AC-SRM-210
and A1-F18AC-SRM-211.

This volume contains WP016 00 thru WP026 00.

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This manual supersedes A1-F18AC-SRM-212 dated 1 March 1990, including
Change 6, dated 15 December 1994.

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NATEC ELECTRONIC MANUAL

NUMERICAL INDEX OF EFFECTIVE WORK PACKAGES/PAGES

List of Current Changes

Original 0 1 May 1999

Only those work packages/pages assigned to the manual are listed in this index. Insert Change -, dated ----. Dispose of superseded and deleted work packages/pages. Superseded and deleted classified work packages/pages shall be destroyed in accordance with applicable regulations. If changed pages are issued to a work package, insert the changed pages in the applicable work package. The portion of text affected in a changed or revised work package is indicated by change bars or the symbol "R" in the outer margin of each column of text. Changes to illustrations are indicated by pointing hands or change bars, as applicable.

Total number of pages in this manual is 696, consisting of the following:

WP/Page No.	Change No.	WP/Page No.	Change No.	WP/Page No.	Change No.	WP/Page No.	Change No.
Title	0	019 00		020 03		023 02	
A	0	1 - 47	0	1 - 15	0	1 - 16	0
TPDR-1	0	48 Blank	0	16 Blank	0	024 00	
TPDR-2 Blank	0	49	0	021 00		1 - 25	0
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HMWS-10 Blank	0	51	0	4 Blank	0	024 01	
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1 - 56	0	53 - 58	0	1 - 42	0	024 02	
016 01		59	0	022 01		1 - 19	0
1 - 55	0	60 Blank	0	1 - 19	0	20 Blank	0
56 Blank	0	61	0	20 Blank	0	024 03 Deleted	0
016 02		62 Blank	0	022 02		024 04	
1 - 6	0	63	0	1 - 19	0	1 - 21	0
016 03		64 Blank	0	20 Blank	0	22 Blank	0
1 - 11	0	65	0	022 03 Deleted	0	025 00	
12 Blank	0	66 Blank	0	022 04		1 - 32	0
016 04		67 - 71	0	1 - 33	0	025 01	
1 - 16	0	72 Blank	0	34 Blank	0	1 - 29	0
016 05		020 00		023 00		30 Blank	0
1 - 28	0	1 - 19	0	1	0	026 00	
017 00		20 Blank	0	2 Blank	0	1 - 9	0
1 - 8	0	020 01		023 01		10 Blank	0
018 00		1 - 16	0	1 - 18	0		
1 - 13	0	020 02					
14 Blank	0	1 - 16	0				
018 01							
1 - 30	0						

LIST OF TECHNICAL PUBLICATIONS DEFICIENCY REPORTS INCORPORATED

ORGANIZATIONAL, INTERMEDIATE, AND DEPOT MAINTENANCE

STRUCTURE REPAIR

WING

1. The TPDRs listed below have been incorporated in this issue.

Identification Number/
QA Sequence Number

Location

None.

WARNINGS APPLICABLE TO HAZARDOUS MATERIALS

Warnings for hazardous materials listed in this manual are designed to warn personnel of hazards associated with such items when they come in contact with them by actual use. Additional information related to hazardous materials is provided in OPNAVINST 5100.23, Navy Occupational Safety and Health (NAVOSH) Program Manual, NAVSUPINST 5100.27, Navy Hazardous Material Control Program, and the DOD 6050.5, Hazardous Materials Information System (HMIS) series publications. For each hazardous material used within the Navy, a material safety data sheet (MSDS) is required to be provided and available for review by users. Consult your local safety and health staff concerning any questions on hazardous chemicals, MSDS'S, personal protective equipment requirements, and appropriate handling and emergency procedures and disposal guidance.

Complete warnings for hazardous materials referenced in this manual are identified by use of an icon, nomenclature and specification or part number of the material, and a numeric identifier. The numeric identifiers have been assigned to the hazardous materials in the order of their appearance in the manual. Each hazardous material is assigned only one numeric identifier. Repeated use of a specific hazardous material references the numeric identifier assigned at its initial appearance. The approved icons and their applications are shown below in Explanation of Hazardous Symbols.

In the text of the manual, the caption **WARNING** will not be used for hazardous materials. Such warnings will be identified by an icon and numeric identifier. The material nomenclature will also be provided. The user is directed to refer to the corresponding numeric identifier listed in this WP under the heading HAZARDOUS MATERIALS WARNINGS for the complete warning applicable to the hazardous material.

Biohazard



Fire



Breathing Hazard



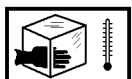
Highly Toxic

Corrosive
(Caustic or Acidic)

Ingestion Hazard



Cryogenic



Oxidizer



Explosive



Radiation



Eye Protection



Skin Hazard



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HMWS-2

EXPLANATION OF HAZARDOUS SYMBOLS



The abstract symbol shows a material that may contain bacteria or viruses that present a health hazard.



The symbol of a human figure in a cloud shows that breathing this material can present a health hazard.



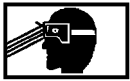
The symbol of drops of a liquid burning a hand shows a material that causes burns to human skin or tissue.



The symbol of a hand in a block of ice shows a material is so cold it will burn your skin on contact.



The rapidly expanding symbol shows that the material may explode if subjected to high temperature, sources of ignition, or high pressure.



The symbol of a person wearing goggles shows a material that can injure your eyes.



The symbol of a fire shows that a material can ignite and burn you.



The symbol of a skull and crossbones shows a material that is highly toxic and can be a danger to life and health.



The symbol of a liquid entering the mouth shows that eating or drinking this material can cause a health hazard.



The symbol of an "O" with a flame shows a material that will promote fire and cannot be stored near flammable or organic materials.























The symbol of three circular wedges shows that the material emits radioactive energy and can injure human tissue or organs.



















The hand symbol shows a material that can irritate the skin or enter the body through the skin and cause a health hazard.

















HAZARDOUS MATERIALS WARNINGS

Index	Material	Warning
1	Sealing Compound, MIL-S-81733	Sealing Compound, MIL-S-81733 is toxic. Prolonged breathing of vapors from organic solvents, or materials containing organic solvents, is dangerous. Rubber gloves shall be used. Wash hands thoroughly with soap and water before eating, drinking or smoking. Contains chromates; follow approved toxic waste disposal procedures.
	  	
2	Adhesive, EA 9321	Adhesive, EA 9321, is toxic and flammable. Avoid contact with skin and eyes. Use in well ventilated area and avoid breathing vapors. Wash hands thoroughly after each use. Close container after usage. Store in a cool, dry, and well ventilated area. Avoid contact with strong oxidizing agents. Protection: rubber gloves, chemical resistant goggles, and protective skin compound; respirator with organic vapor cartridge required in poorly ventilated areas.
	    	
3	Adhesive, EA934	Adhesive, EA934, is toxic. Avoid breathing of vapors. Avoid contact with skin or eyes. Wear gloves and goggles while handling. If eye contact is made, wash immediately with large amount of water. If skin contact is made, wash immediately with soap and water.
	   	
4	Isopropyl Alcohol, TT-I-735	Isopropyl Alcohol, TT-I-735, is highly flammable. Do not use synthetic wiping cloths due to possible electrostatic discharge and ignition. Isopropyl alcohol is also toxic to the skin, eyes, and respiratory tract. Skin and eye protection are required. Avoid repeated or prolonged contact.
	   	
5	Sealing Compound, MIL-S-83430	Sealing Compound, MIL-S-83430, is flammable and toxic to eyes, skin, and respiratory tract. Prolonged overexposure via inhalation may cause liver and/or kidney damage. Protection: Chemical splashproof goggles and solvent resistant gloves. Keep compound off skin and eyes. Keep away from open flames or other sources of ignition. Use only in well ventilated areas. Insure good personal hygiene prior to eating, drinking, or smoking.
	   	















HAZARDOUS MATERIALS WARNINGS (Continued)

Index	Material	Warning
6	Epoxy Resin Adhesive, EPON 828	Epoxy Resin Adhesive, EPON 828, is toxic and flammable. Avoid contact with skin and eyes. Use in well ventilated area and avoid breathing vapors. Wash hands thoroughly after each use. Close container after usage. Store in a cool, dry and well ventilated area. Avoid contact with strong oxidizing agents. Protection: rubber gloves, chemical goggles and protective skin compound; respirator with organic vapor cartridge required in poorly ventilated areas.
	   	
7	Polyamide Resin, Versamid 125	Polyamide Resin, Versamid 125, is flammable. Do not use near open flames, welding areas, or on hot surfaces. When decomposed by heating, toxic fumes are released. Do not smoke when using resins and hardeners and do not use where others are smoking. Contact with liquid or vapor can irritate skin and respiratory tract. Repeated exposure can cause skin sensitization. If liquid contacts skin or eyes, immediately flush affected area with water. If vapors are inhaled, go to fresh air. When handling liquid or mixed compound at air-exhausted workbench, wear approved gloves and goggles. When handling liquid or mixed compounds at open unexhausted area, wear approved respirator, gloves, apron and goggles. Metal containers or solution must be grounded to maintain electrical continuity.
	   	
8	Cleaning Compound, PR146 Blue	Cleaning Compound, PR146 Blue, is toxic to skin, eyes, and respiratory tract. Skin and eye protection required. Avoid repeated or prolonged contact. Good general ventilation is normally adequate.
	   	
9	Coating, Corrosion Preventive, MIL-C-27725, Type 2, Class B	Coating, Corrosion Preventive, MIL-C-27725, Type 2, Class B, is toxic and flammable. Avoid prolonged or repeated skin contact. Avoid contact with eyes. If eye contact is made, flush with water for 15 minutes. Use in well ventilated area and avoid prolonged breathing of vapors. Wash hands thoroughly after each use. Protection: rubber gloves, chemical splashproof goggles; use air line or air purifying respirator in poorly ventilated areas, or where spray mist is present. Closed containers may explode when exposed to extreme heat. Vapors may accumulate in inadequately ventilated areas. Vapors may form explosion when mixed with air. Do not store near heat, spars, open flame, strong acids or strong bases.
	   	

HAZARDOUS MATERIALS WARNINGS (Continued)

Index	Material	Warning
10	Sealing Compound, MIL-S-8802	Sealing Compound, MIL-S-8802, is flammable and toxic to eyes, skin, and respiratory tract. Keep away from open flames or other sources of ignition. Prolonged breathing of vapors from organic solvents or materials containing organic solvents is dangerous. Rubber gloves shall be used. Use only in well-ventilated areas. Wash hands thoroughly with soap and water before eating, drinking, or smoking. Contains chromates; follow approved toxic waste disposal procedures.
	    	
11	Sealing Compound, G-651A	Sealing Compound, G-651A, is toxic. Avoid prolonged or repeated skin contact. Avoid contact with eyes. Use in well ventilated area and avoid prolonged breathing of vapors. Wash hands thoroughly after each use. Protection: rubber gloves, chemical splash-proof goggles with side shields, and protective skin compound; use dust mask when sanding dry film; half mask respirator with organic vapor cartridge required in poorly ventilated areas. Keep from freezing. Store material in areas with temperature range of 50-90_F.
	   	
12	Sealing Compound, Q4-2805	Sealing Compound, Q4-2805, is toxic. Avoid prolonged skin contact. Avoid contact with eyes. Use in well ventilated area and avoid prolonged breathing of vapors. Wash hands thoroughly after each use. Protection: rubber gloves, chemical splashproof goggles; half mask respirator with organic vapor cartridge required in poorly ventilated areas. Material may form highly toxic trifluoropropionaldehyde vapor if heated in air above 300_F. Do not store near strong oxidizing materials.
	  	
13	Lubricating Oil, VV-L-800	Lubricating Oil, VV-L-800, is flammable; keep away from heat, flames and very hot surfaces. Do not smoke when using it. Use in well ventilated area. Inhalation of vapors is harmful. If vapors cause light-headedness, go to fresh air. Wear neoprene gloves, safety goggles or full face shield. If splashed in eyes flush with water for 15 minutes. Contact with skin wash with mild soap and warm water. Prolonged contact may cause dermatitis, irritation and narcotic effect. If swallowed get medical advice before taking further action. Keep solution away from strong oxidizers or caustics. Keep away from spillage. Use absorbent to soak up spilled solution.
	   	

HAZARDOUS MATERIALS WARNINGS (Continued)
















Index	Material	Warning
14	Grease, Aircraft, MIL-G-81322	Avoid any skin contact with Aircraft Grease, MIL-G-81322. Wash hands thoroughly prior to eating, drinking or smoking. Do not apply to hot surfaces; toxic gases may be released.
	 	
15	Methyl Ethyl Ketone, TT-M-261	Methyl Ethyl Ketone, TT-M-261, is flammable. Do not use near open flames, near welding areas, or on hot surfaces. Do not smoke when using it, and do not use it where others are smoking. Contact with liquid or vapor can cause skin irritation, dermatitis and drowsiness. If there is any prolonged skin contact, wash contacted area with soap and water. Remove solvent saturated clothing. If vapors cause drowsiness, go to fresh air. If irritation persists, get medical attention. When handling liquid at air-exhausted workbench, wear approved gloves, goggles and long sleeves. When handling liquid or liquid-soaked cloth in open unexhausted area, wear approved respirator, gloves and goggles. Dispose of liquid-soaked rags in approved metal container. Metal containers of solution must be grounded to maintain electrical continuity.
	  	
16	Adhesion Film Promoter, No. 86	Adhesion Film Promoter, No. 86, is flammable and toxic. Avoid sparks, flame, and heat. Use in well ventilated areas. Protection: chemical resistant goggles and gloves.
	    	
17	Toluene, Technical, TT-T-548	Technical Toluene (TT-T-548) is flammable; do not use solution near welding areas, near open flames or on hot surfaces. Do not smoke and do not use it where others are smoking. Contact with liquid or vapor can cause irritation and light-headedness. Repeated exposure can cause dermatitis and temporary tingling sensation in fingers. If any liquid contacts skin, flush affected area thoroughly with water. Immediately remove solvent-saturated clothing. If vapors cause light-headedness, go to fresh air. When solvent is handled at air-exhausted workbench, wear approved gloves. When solvent is handled at unexhausted work area, wear approved respirator, gloves and apron. Dispose of liquid-soaked rags in approved metal container. Store solvent in approved metal safety container.
	   	

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HAZARDOUS MATERIALS WARNINGS (Continued)

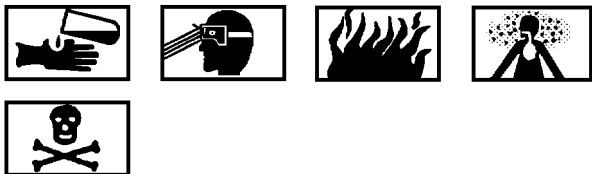



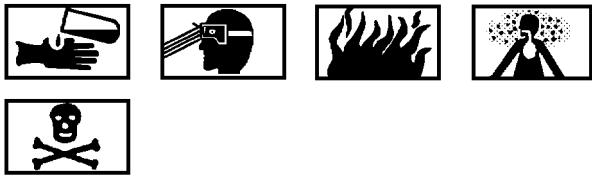
Index	Material	Warning
18	General Purpose Detergent (Liquid), MIL-D-16791	Do not take general purpose detergents internally. Do not get in eyes. Wear goggles or face shield when handling.
	 	
19	Adhesive, EA 956	Adhesive, EA 956, is toxic and flammable. Avoid contact with skin and eyes. Use in well ventilated area and avoid breathing vapors. Wash hands thoroughly after each use. Close container after usage. Store in a cool, dry, and well ventilated area. Avoid contact with strong oxidizing agents. Protection: rubber gloves, chemical resistant goggles, and protective skin compound; respirator with organic vapor cartridge required in poorly ventilated areas.
	    	
20	Fluorocarbon Lubricant, MS-122	Fluorocarbon Lubricant, MS-122, is toxic and can release poison gas when heated. Excessive inhalation during normal use can cause dizziness, narcosis, and eye irritation. It can also contaminate smoking tobacco. Do not smoke tobacco exposed to the lubricant. Do not breathe vapors. Avoid contact with eyes and skin. Mild skin irritant. No smoking in area where fluorocarbon lubricant is used. Use in well ventilated areas. Protection: Chemical splash proof goggles, gloves and good ventilation. Ensure good personal hygiene prior to eating, drinking, or smoking.
	   	
21	Jet Fuel, JP-4 and JP-5, MIL-T-5624, JP-8, MIL-T-83133	Jet Fuel (JP-4 and JP-5, MIL-T-5624; JP-8, MIL-T-83133) is flammable. Do not use near open flames, near welding areas or on hot surfaces. Do not smoke when using it and do not use it where others are smoking. Contact of skin with liquid can irritate skin. Contact of eyes with liquid can cause severe irritation and blurred vision. Inhalation of vapor may cause irritation, headache, nausea, and dizziness. If liquid contacts eyes, flush eyes thoroughly with water. Immediately remove fuel-saturated clothing. If vapors cause dizziness, go to fresh air. If liquid is swallowed, do not try to vomit. Get medical attention. When handling large quantities of liquid (more than one gallon) at an unexhausted workbench, wear approved respirator and goggles or face shield. Dispose of liquid-soaked rags in approved metal container. Metal containers of fuel must be grounded to maintain electrical continuity.
	   	

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HAZARDOUS MATERIALS WARNINGS (Continued)

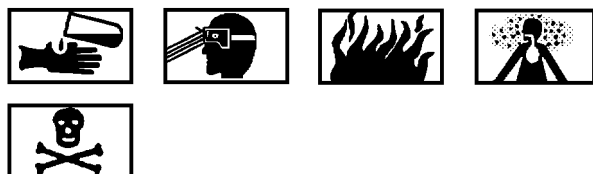
Index	Material	Warning
22	Adhesive, FM300	Adhesive Film, FM300, is toxic. Avoid prolonged or repeated skin contact. Avoid contact with eyes. Do not handle or store near heat, open flame, sparks, strong bases or strong acids. Store at or below 0°F to prolong shelf life. Wash hands thoroughly after each use. Protection: white cotton gloves worn over plastic gloves; use dust mask during grinding/cutting cured resin, half-mask respirator with organic vapor cartridge required in poorly ventilated areas.
		
23	Nitrogen, BB-N-411, Type I (Gaseous)	Nitrogen (BB-N-411, Type I (Gaseous)) acts as a natural asphyxiant. Use in well ventilated spaces.
		
24	Release Agent, Airtech A4000	Release Agent, Airtech A4000, is toxic. Avoid prolonged or repeated skin contact. Avoid contact with eyes. Use in well ventilated area and avoid prolonged breathing of vapors. Wash hands thoroughly after each use. Protection: rubber gloves, chemical splash-proof goggles. Avoid strong oxidizing agents. Do not cut, grind, weld, or drill on or near this container.
		
25	Petrolatum, Technical, VV-P-236	Technical Petrolatum, VV-P-236, is an eye irritant and upon exposure may cause skin irritation. May cause stomach/intestinal irritation upon ingestion. Avoid extreme heat and strong oxidizing agents. Protection: neoprene gloves and chemical goggles.
		
26	Coating, Chemical Conversion, MIL-C-81706, Class 1A, Form 3	Chemical conversion coating, MIL-C-81706, Class 1A, Form 3 is toxic and flammable. Avoid contact with skin and eyes. Avoid breathing vapors; upper respiratory tract irritation or damage may occur. May be harmful or fatal if swallowed. Contains chromic acid, a systemic toxin and may aggravate pre-existing conditions. Wash hands and face thoroughly after use. Immediately remove contaminated clothing and launder before re-use. Avoid humidity, strong acids, alkalies, reducing compounds, flammable or combustible materials. Store in a dry area in tightly closed containers. Store away from oils, greases, and corrosives. When mixing: add slowly to water while mixing. Protection: rubber gloves, chemical goggles, faceshield, and laboratory apron; half mask respirator with acid/organic vapor cartridge and mist pre-filter is required during spray operations or in poorly ventilated areas.
		

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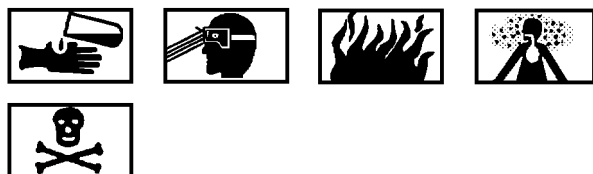
HMWS-9/(HMWS-10 blank)

27 Primer Coating, Epoxy, MIL-P-23377



Primer Coating, Epoxy, MIL-P-23377, Type 1 or Type 2, is toxic and flammable. Do not use near open flames, welding areas, or on hot surfaces. Do not eat, drink, or smoke where primers are being mixed, handled, or cleaned up. Prolonged breathing of vapors or spray mist is dangerous and may cause allergic reactions. Avoid prolonged skin contact. Contains chromates; follow approved toxic waste disposal procedures. Store tightly in a cool, dry, well ventilated area. Launder contaminated clothing before reuse. Protection: full facepiece continuous flow supplied air respirator, gloves, chemical resistant goggles, faceshield, protective skin compound, protective clothing required during spraying operations.

28 Aliphatic Polyurethane Enamel MIL-C-83286



Aliphatic Polyurethane Enamel MIL-C-83286, is toxic and flammable. Do not use near open flames, welding areas, or on hot surfaces. Do not eat, drink, or smoke where primers are being mixed, handled, or cleaned up. Prolonged breathing of vapors or spray mist is dangerous and may cause allergic reactions. Avoid prolonged skin contact. Contains chromates; follow approved toxic waste disposal procedures. Store tightly in a cool, dry, well ventilated area. Launder contaminated clothing before reuse. Protection: full facepiece continuous flow supplied air respirator, gloves, chemical resistant goggles, faceshield, protective skin compound, protective clothing required during spraying operations.

29 Paint Remover MIL-R-81294



Paint remover is toxic. Avoid breathing vapors. Avoid contact with skin or eyes. Wear gloves while handling. If eye contact is made, wash immediately with large amount of water. If skin contact is made, wash immediately with soap and water.

ORGANIZATIONAL, INTERMEDIATE, AND DEPOT MAINTENANCE

STRUCTURE REPAIR

INBOARD LEADING EDGE FLAP

PART NO. 74A190002

EFFECTIVITY: 161353 THRU 161519

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Lower Inner Wing External Doors 146, 147, 149, 150, 194, 195, 196, 197,	
Seals 74A110661 and 74A110978	WP006 01
Fairing - Wing Fold, Effectivity: 161353 THRU 161519	WP016 02
Aircraft Corrosion Control	A1-F18AC-SRM-500
Chemical Treatment	WP008 00
Inner and Outer Wing Finish System and Markings	WP027 00
Integrated Flight Controls	A1-F18AC-570-300
Inboard Flap (84MPU535 or 84MPV536)	WP028 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Nondestructive Inspection	A1-F18AC-SRM-300
Penetrant Method	WP004 00
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Inboard Flap, Water in Honeycomb	WP017 00
Structure Repair, General Information	A1-F18AC-SRM-200
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Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
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Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class I Damage Repair	WP022 00
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Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class III Damage Repair	WP024 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class IV Damage Repair	WP025 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class V Damage Repair	WP026 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class VI Damage Repair	WP027 00
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Aluminum and Titanium Sheet, Formed Structure	WP033 00
Aluminum Sheet Edge Repairs	WP034 00
Aluminum Sheet Repairs Across Structure and Lands	WP036 00
Blending	WP038 00
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Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 27	-	Improvement of Leading Edge Flap Design (ECP 44C1/C2)	1 Mar 87	-
F/A-18 AFC 159	-	Inboard Leading Edge Flap (ILEF) Seal Modifica- tion (RAMEC L-47-89)	1 Aug 92	-

1. ALUMINUM SKIN - HONEYCOMB CORE. See figures 1 and 2.

2. DAMAGE EVALUATION. See figures 1, 2 and

3. Damage is classified as negligible and repairable. Locating and determining size of damage by visual method is organizational maintenance. Locating and determining size of damage by NDI method is intermediate maintenance. Damage not listed or exceeding the limits listed below requires a depot engineering disposition.

3. Negligible Damage. See figures 1 and 2. Negligible damage is damage which does not exceed the type and limits listed below and may be allowed to exist as is.

a. Smooth dents free of sharp corners and abrasions.

(1) Depth is no more than 0.015 inch.

(2) Diameter is not more than 0.5 inch.

(3) No more than three dents occur in any 3 inch diameter circle.

(4) No more than six dents occurring in any 10 inch diameter circle.

(5) Dents occurring in a line and spaced closer than 1-1/2 dent diameter do not exceed 3 inches in length.

b. Voids and separations in the adhesive along the length of the bend radius of structural part and of edge member to core to which the core is bonded.

(1) The width is not wider than the bend radius.

(2) Voids and separations do not exceed two square inches in any 10 square inches.

(3) Voids and separations do not exceed more than five percent of the total bonded area.

4. Repairable Damage. See figures 1 and 3. Repairable damage is damage that can be permanently repaired with no adverse affect on structural integrity, flight characteristics, or safety of aircraft.

5. Voids or Unbonds Between Skin and Core, Class I Damage. See figure 3, section A. Class I damage is damage which does not exceed the limits listed below:

a. Diameter is 4 inches or less.

b. Area of damage does not exceed four percent of bonded area.

6. Dents Without Honeycomb Core Damage, Class II Damage. See figure 3, section B. Class II damage is damage which does not exceed limits below:

a. Diameter is 0.50 to 1.5 inches.

b. Depth is 0.015 to 0.050 inches.

c. No crushed core or unbond.

7. Dents With Honeycomb Core Damage, Class III Damage. See figure 3, section C. Class III damage is damage which does not exceed limits listed below:

a. Diameter is 0.50 to 1.5 inches.

b. Depth is 0.015 to 0.050 inch.

c. May have crushed core or unbonds.

8. Damage Less Than 1.5 Inches Length or Diameter to One Skin, Class IV Damage. See figure 3, Section D. Class IV damage is damage which does not exceed limits listed below:

a. Damage to one skin only.

b. Length or diameter does not exceed 1.5 inches.

c. Core may or may not be damaged.

9. Damage More Than 1.5 Inches Length or Diameter, up to 4 Inches Maximum to One Skin, Class V Damage. See figure 3, section E. Class V damage is damage which does not exceed limits listed below:

a. Damage to one skin only.

b. Length or diameter is 1.5 to 4.0 inches.

c. Core damage of any level.

10. Damage Less Than 1.5 Inches Length or Diameter, to Both Skins, Class VI Damage. See

figure 3, section F. Class VI damage is damage which does not exceed limits listed below:

- a. Damage may be to both skins.
- b. Length or diameter does not exceed 1.5 inches in length.
- c. Core damage of any level.

11. Damage More Than 1.5 Inches Length or Diameter, Up to 4.0 Inches Maximum to Both Skins, Class VII Damage. Class VII damage includes cracks, bulges, punctures, and sharp dents. See figure 3, section G. Class VII damage is damage which does not exceed limits listed below:

- a. Damage is to both skins.
- b. Crack is 1.5 to 4.0 inches in length.
- c. Bulges, punctures, and dents which can be enclosed in a circle more than 1.5 inches diameter, but less than 4.0 inches diameter.

- d. Core damage of any kind exists.

12. Structure to Skin or Honeycomb Core, Void or Unbond, Class VIII Damage. See figure 3, section H. Class VIII damage is damage which does not exceed limits listed below:

- a. Between skin and edge member, not extending into core.
- b. Damage may or may not be open to the edge.
- c. Voids between edge member and core.

13. Honeycomb Core Splice, Void or Unbond, Class IX Damage. See figure 3, section J. Class IX damage is damage that occurs at the honeycomb core splice line.

14. Water in Honeycomb Core, Class X Damage. To inspect for water in honeycomb core NDI (A1-F18AC-SRM-300, WP017 00). Class X damage is water trapped in honeycomb core.

15. **REPAIRS.** Blend scratches, nicks, gouges, or corrosion (A1-F18AC-SRM-250, WP038 00). If, before or after blending, the damage limits of Table 2 are exceeded, repair damage. Classes I, II, III, IV, VI, VIII, IX, X are organizational maintenance. Classes V and VII are intermediate maintenance. Repair damage by the procedures referenced below:

a. Repair Class I damage and install patch (A1-F18AC-SRM-250, WP022 00).

b. Repair Class II damage (A1-F18AC-SRM-250, WP023 00).

c. Repair Class III damage and install patch (A1-F18AC-SRM-250, WP024 00).

d. Repair Class IV damage and install patch (A1-F18AC-SRM-250, WP025 00).

e. Repair Class V damage and install patch (A1-F18AC-SRM-250, WP026 00).

f. Repair Class VI damage and install patch (A1-F18AC-SRM-250, WP027 00).

g. Repair Class VII damage and install patch (A1-F18AC-SRM-250, WP028 00).

h. Repair Class VIII damage (A1-F18AC-SRM-250, WP029 00).

i. Repair Class IX damage and install patch (A1-F18AC-SRM-250, WP030 00).

j. Repair Class X damage (A1-F18AC-SRM-250, WP005 00).

16. FAIRING, WING FOLD.

17. For repairs and replacement (WP016 02).

18. METAL SKINS AND STRUCTURE.

19. **DAMAGE EVALUATION.** See figures 1 and 4. Damage is classified as negligible and repairable. The types of materials used are shown on figure 1. Repair zones are shown on figure 4. Allowable damage limits within repair zones are listed in tables 1 and 2. Locating and determining size of damage by visual method is organizational maintenance. Damage not listed or exceeding the limits below requires a depot engineering disposition.

20. **Negligible Damage.** Negligible damage is damage that may be allowed to exist as is. However, preventive maintenance, for temporary corrosion arrestment, should be done to scratches (NAVAIR 01-1A-509). The types and limits of damage are listed below and in table 1. The figure and index numbers in table 1 coincide with the figure and index numbers in the material index.

a. Scratches are not allowed within one diameter from the edge of any hole.

b. Smooth dents only, effective diameter at least 20 times the depth.

21. Repairable Damage. The types and limits of damage are listed below and in table 2. The figure and index numbers in table 2 coincide with figure and index numbers in the material index, figure 1.

NOTE

The limits in table 2 apply after blending the damage.

a. Scratches.

(1) Any scratches within one diameter of any hole must be blended out. Minimum blend out is one diameter from edge of any hole.

(2) Scratches to be blended out with diameter, or width, at surface at least 20 times the depth.

b. Nicks, gouges, and corrosion to be blended out with diameter, or width, at surface at least 20 times the depth.

c. Cracks. All cracks must be repaired.

d. Holes.

(1) Damage in areas free of structure and lands must have edge cleanup hole at least eight repair fasteners diameters from any land, internal structure, or existing row of fasteners.

(2) Damage to lands, over structure, only one repair per land.

e. Dents exceeding the limits in Table 1 must be repaired.

22. REPAIRS. Types of repairs are temporary, one-time flight, permanent, critical area, alternate, and typical. Repair type definition are in structure repair terms (A1-F18AC-SRM-200, WP002 00).

23. Permanent Repairs.

24. Scratches, Nicks, Gouges, or Corrosion. Blend scratches, nicks, gouges, or corrosion (A1-F18AC-SRM-250, WP038 00). If, after blending, the damage

limits of table 2 are exceeded, repair aluminum sheet. Refinish blended areas (A1-F18AC-SRM-500, WP027 00).

a. Scratches - make crack or edge repairs.

b. Nicks, gouges, or corrosion - make hole or edge repair.

25. Cracks.

a. In repair zones A1, A2, and A3, repair cracks free of structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP031 00).

(1) Stop drill ends of crack in repair zones A1 and A2. Rout out crack in repair zone A3.

(2) Install lap patch.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

b. In repair zone B3, repair cracks free of structure or land areas in aluminum sheet (0.050 inch thickness or less).

(1) Cut out damage in the smallest diameter circle.

(2) Fabricate patch (A1-F18AC-SRM-250, WP006 01).

(3) Install patch using FM 300 adhesive (A1-F18AC-SRM-250, WP007 00).

(4) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

c. In repair zones A1, A2, and A3, repair cracks across structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP036 00).

(1) Cut out damage.

(2) Make repairs given below.

(a) Damage to Bay Requiring Repair Across Land; install flush or lap patch.

(b) Damage to Bay Requiring Repair Across Land and Edge of Part; install flush or lap patch.

(c) Damage to Land or Land or Bay; install flush or lap patch.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

d. In repair zones A1, A2, and A3, repair cracks to aluminum formed structure (A1-F18AC-SRM-250, WP033 00).

(1) Cut out damage.

(2) In repair zones A1, A2, or A3, install repair one through six. Select the repair that can be adapted to the damaged part.

(3) Refinish repaired area (NAVAIR 01-1A-509).

26. Holes.

a. In repair zones A1, A2, and A3, repair holes free of structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP031 00).

(1) Cut out damage.

(2) Install type one flush or lap patch.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

b. In repair zone B3, repair holes free of structure or land areas in aluminum sheet (0.050 inch thickness or less).

(1) Cut out damage in the smallest diameter circle.

(2) Fabricate patch (A1-F18AC-SRM-250, WP006 01).

(3) Install patch using FM 300 Adhesive (A1-F18AC-SRM-250, WP007 00).

(4) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

c. In repair zones A1, A2, and A3, repair holes across structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP036 00).

(1) Cut out damage.

(2) In repair zones A1, A2, or A3, make repairs.

(a) Damage to Bay Requiring Repair Across Land; install flush or lap patch.

(b) Damage to Bay Requiring Repair Across Land and Edge of Part; install flush or lap patch.

(c) Damage to Land or Land or Bay; install flush or lap patch.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

d. In repair zones A1, A2, and A3, repair holes to aluminum formed structure (A1-F18AC-SRM-250, WP033 00).

(1) Cut out damage.

(2) In repair zones A1, A2, or A3, install repair one through six. Select the repair that can be adapted to the damaged part.

(3) Refinish repaired area (NAVAIR 01-1A-509).

27. Edge. In repair zones A1, A2, and A3, repair edge damage in aluminum sheet (A1-F18AC-SRM-250, WP034 00).

a. Cut out damage.

b. Select repair patch (A1-F18AC-SRM-250, WP034 00)

(1) Corner Damage to Lands.

(2) Corner Damage to Lands and Bays.

(3) Edge Damage to Lands.

(4) Edge Damage to Lands and Bays.

(5) Full Width Damage to End.

c. Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

28. Dents.

a. In repair zones A1, A2, and A3, repair dents free of structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP031 00).

(1) Cut out damage.

(2) Install type one flush or lap patch.

(3) Refinish repaired area (A1-F18AC-SRM-250, WP027 00).

b. In repair zone B3, repair dents free of structure or land areas in aluminum sheet (0.050 inch thickness or less).

(1) Cut out damage in the smallest diameter circle.

(2) Fabricate patch (A1-F18AC-SRM-250, WP006 01).

(3) Install patch using FM 300 Adhesive (A1-F18AC-SRM-250, WP007 00).

(4) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

c. In repair zones A1, A2, or A3, repair dents across structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP036 00).

(1) Cut out damage.

(2) Make repairs given below.

(a) Damage to Bay Requiring Repair Across Land; install flush or lap patch.

(b) Damage to Bay Requiring Repair Across Land and Edge of Part; install flush or lap patch.

(c) Damage to Land or Land and Bay; install flush or lap patch.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

d. In repair zones A1, A2, and A3, repair dents to aluminum formed structure (A1-F18AC-SRM-250, WP033 00).

(1) Cut out damage.

(2) Install repair one through six. Select the repair that can be adapted to the damaged part.

(3) Refinish repaired area (NAVAIR 01-1A-509).

29. Spar Lower Flange Repair. This repair is intermediate level maintenance. For attaching hardware (WP006 01). Repair is only for lower flange between outboard transmission lug and the outboard hinge. Bays are numbered from transmission lugs, outboard. Bays 1 thru 14 are repairable, see figure 5.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
7075-0 Alclad, 0.100 (Repair Clip)	QQ-A-250/12
7075-T6 Alclad, 0.080 (Filler for Spar Flanges) and 0.050 (Filler for Bay 3 Web)	QQ-A-250/12
Adhesive	EA9321A/B
Blind Fastener (as Required)	PLT270-5-()
Cloth, Scrim, Nylon	Pattern 30
Rivet, Solid, Flush, Tension Head	MS20426AD4
Screw (as Required)	HT4024L4-()
Sealing Compound	MIL-S-81733, Type 1/2

a. For bays 1 and 2, remove door 149 (A1-F18AC-LMM-010). For bays 3 thru 14, remove seal 74A190617 by removing rivets.

b. Remove gang channel from spar flange (bay 1), or plate assembly from spar flange (bay 2).

c. Trim damaged flanges, views A and B.

d. Do a type I, method C fluorescent penetrant inspection to be sure cracks are removed, (A1-F18AC-SRM-300, WP004 00).

e. For bay 3, remove ST9M387-6 plate and 74A190633 brackets. Remove sealant from around 74A190827 cover.

f. Locate and drill holes in spar, views C, D, and E.

g. Cold work holes in spar (A1-F18AC-SRM-200, WP004 10).

h. Ream holes to final diameter, views C, D, and E.

i. Fabricate repair clip for bay 1 view F, for bays 2 thru 8 view G; for bays 9 thru 14 view H.

j. Fabricate repair fillers for bay 3, view J.

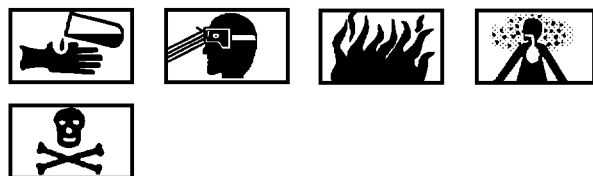


Sealing Compound

1

k. Attach repair clip, and filler for bay 3 web, to spar using blind fasteners, views C, D, and E. Install fasteners wet with sealing compound (A1-F18AC-SRM-200, WP011 00).

l. Fabricate filler to fit in spar flange cut out area, and match drill fastener holes views C, D, and E.



Adhesive

2

m. Prepare EA9321 A/B adhesive and bond spar flange filler to repair clip, with scrim cloth between filler and clip, using adhesive (A1-F18AC-SRM-200, WP011 00).

n. For bay 1 bond gang channel, for bay 2 bond plate assembly removed in step b to repair clip with EA9321 A/B adhesive per Bonding Gang Channel with Adhesive (A-F18AC-SRM-200, WP004 05).

o. For bay 1, install rivet through filler, clip, and gang channel, view C; for bays 2 thru 14, install rivet through filler, clip, and plate nuts, views D and E.

p. For bay 3, install plate and brackets removed in step e.

q. Refinish repaired area (NAVAIR 01-1A-509).

r. For bays 1 and 2, determine fastener length and install door 149 (A1-F18AC-LMM-010).

s. For bays 3 thru 14, install seal per Seal, 74A190617, Repair, this work package.

t. Verify gap and mismatch per Rework of Seals (74A190616, 74A190617, 74A190618, 74A190623, and 74A190627), this work package.

30. **Seal, 74A190617, Repair.** See figure 6. This repair is only applicable to aircraft before incorporation of F/A-18 AFC 159. Cold working holes is depot level maintenance.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
7075-T6 Alclad, 0.080 (for Seal)	QQ-A-250/25
7075-T6 Alclad, 0.063 (for Bracket)	QQ-A-250/25
Extrusion (for Tee)	1MA160D03-10277

31. Total Replacement.

a. Remove seal by removing rivets (NAVAIR 01-1A-8).

b. Fabricate repair stiffeners, view B, and repair seal, view C.

c. Do chemical treatment to fabricated parts (A1-F18AC-SRM-500, WP008 00).

d. Cold work holes as required, view A (A1-F18AC-SRM-200, WP004 10).

e. Locate, drill, and countersink spar fastener holes in repair seal.

f. Locate repair seal in place on lower flange of spar.

g. Locate and install repair stiffeners on spar with rivets using squeeze method (NAVAIR 01-1A-8). For spar fasteners, view B. For locations of stiffeners on spar, view A.

h. Drill and countersink repair stiffener fastener holes in repair seal.

i. Install fasteners in seal and stiffeners. See figure 7 for fasteners.

j. Inspect for satisfactory clearance between repair stiffeners and wing upper and lower seals per Rework of Seals (74A190616, 74A190617, 74A190618, 74A190623 and 74A190627), this WP.

k. Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

32. Section Replacement.

NOTE

Any section along total length of seal may be repaired provided a minimum of 2 fasteners are located in the section.

a. Remove damaged section of flap seal by removing rivets (NAVAIR 01-1A-8) and cutting seal on centerline between 2 fasteners, view J.

b. Fabricate section of seal to fill area of removed seal.

c. Do chemical treatment to section of seal (A1-F18AC-SRM-500, WP008 00).

d. Cold work holes as required, view J (A1-F18AC-SRM-200, WP004 10).

e. Locate, drill, and countersink fastener holes in seal section.

f. Install seal section. For fasteners see figure 7.

g. Inspect for satisfactory clearance between repair stiffeners and wing upper and lower seals per Rework of Seals (74A190616, 74A190617, 74A190618, 74A190623 and 74A190627), this WP.

h. Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

33. Leading Edge Flap Transmission Rod, Cadmium Plating Repair. Cadmium plating shall be replaced if worn or damaged. Replacement of cadmium plating is intermediate level maintenance. For removal and installation, and part information (A1-F18AC-570-300, WP028 00).

Support Equipment Required

None

Materials Required

None

a. Remove worn or damaged plating from rod.

b. Do NDI on unplated rod per Magnetic Particle Method (A1-F18AC-SRM-300, WP006 00).

c. If rod is damaged, get replacement rod and go to step f. If rod is undamaged, continue with next step.

d. Measure diameter of unplated rod.

(1) If diameter is less than 0.6613, get replacement rod and go to step f.

(2) If diameter is equal to, or more than 0.6613, but less than 0.6619, apply cadmium plating to rod.

NOTE

Nominal rod diameter, after cadmium plating is 0.6630, +0.0000, -0.0011.

e. Measure newly plated rod to make sure it is within nominal diameter.

f. Install rod.

34. Temporary Repairs.

35. Seals, 74A190617 and 74A190627, Crack Repair. See figure 10. This temporary repair is done with seals installed on the aircraft and is satisfactory until aircraft is down for other maintenance action. Seals shall be monitored after each flight for more cracks. Combined length of all cracks shall not exceed 4.0 inches.

Support Equipment Required

None

Materials Required

None

a. Inspect seals and determine amount of damage.

(1) If combined length of all cracks is 4.0 inches or less, go to step b.

(2) If combined length of all cracks is more than 4.0 inches, replace seal.



Do not stop drill cracks over existing substructure. Damage to substructure will occur.

b. Stop drill cracks by drilling a 0.187 diameter hole at one or both ends of cracks.

c. Clean area of shavings.

36. REWORK OF SEAL (74A190616, 74A190617, 74A190618, 74A190623, AND 74A190627). See figure 8.

a. Trim seals to allowable gap, views A, B, C and D.

b. Refinish trimmed edge (A1-F18AC-SRM-500, WP027 00).

37. REPLACEMENT.

38. Transmission Seal Assembly, 74A190678, Replacement. See figure 9. Any or all parts will be locally manufactured and assembled as shown.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA934
Bushing	4M106-10006
Extrusion (for 74A190677-2001 thru -2006)	1MA120D06-10308
Extrusion (for 74A190677-2001 thru -2007)	1MA120D06-10309
Extrusion (for, 74A190677-2013 -2014, -2017, -2018)	1MA100D06-10375
Extrusion (for, 74A190677-2015 -2016, -2019, -2020)	1MA100D06-10375
Rivets	CSR902B-5
Seal, Transmission, Lower	74A190616
Seal, Transmission, Upper	74A190618
Shim, AL LAM 5052-H39 (for 74A190678-2001, -2003)	MIL-S-22499, Class 2, Type 1

a. Remove inboard flap (A1-F18AC-570-300, WP028 00).

b. Fabricate replacement supports and shims as required per figure 9.

c. Insert bushings into applicable support, view J.



Adhesive



3

d. Bond bushing to support each location as shown, view J, using adhesive. Adhesive preparation and application (A1-F18AC-SRM-200, WP011 00).

e. Get replacement seals as required.

f. Assemble replacement parts per steps below:

(1) Locate supports in transmission and insert rod to hold parts in place.

(2) Trim and drill replacement seal using rivet holes in supports (A1-F18AC-SRM-200, WP004 06).

(3) Remove pins and supports. Clean shavings from area.

(4) Attach supports and shims to seal using rivets.

g. Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

h. Install inboard flap (A1-F18AC-570-300, WP028 00).

39. Seal, 74A190627, Replacement. See figure 11.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Blind Rivet (CAGE 98524)	PLT1058-5-4
Blind Rivet (CAGE 92215)	PLT1064-5-4
Isopropyl Alcohol	TT-I-735, Grade 1
Rymple Cloth	AMS-3819

a. Remove inboard leading edge flap (A1-F18AC-570-300, WP028 00).



Be careful when drilling out rivets not to elongate or oversize holes.

b. Remove existing/damaged seal and shim from structure by drilling out rivets (NAVAIR 01-1A-8, Section I, Rivets).



Isopropyl Alcohol



4

c. Clean spar flange, where seal mated with the leading edge flap, using clean rymple cloth moistened with isopropyl alcohol.

d. Clean up fastener holes. See figure for hole diameters of nominal or first oversize rivets.

e. Get replacement seal and shim. For parts information (A1-F18AC-SRM-410, FIG 012 00).

f. Position replacement shim and seal in place on flap spar and locate fastener holes. For locating blind holes (A1-F18AC-SRM-200, WP004 03).

g. Drill holes in replacement seal and shim to applicable nominal/first oversize diameter. See figure for hole sizes.

h. Countersink holes in seal. See figure for countersink dimensions.

i. Clean and deburr seal and shim. Clean area of any shavings.

j. Attach seal and shim to spar flange using applicable size fastener. See figure for nominal/first oversize fastener part number.

k. Refinish repair area (A1-F18AC-SRM-500, WP027 00).

l. Install inboard leading edge flap (A1-F18AC-570-300, WP028 00).

NOTE









Make sure correct fit and gap exists between replacement seal and leading edge of wing to avoid damage during operation.

m. Do Rework of Seals (74A190617, 74A190618, 74A190623 and 74A190627) for 74A190627 seal, this WP.

Table 1. Negligible Damage Limits

Fig No Idx No	Nomen/ Repair Zone	Thickness	Scratch Depth	Nicks Gouges		Dents Depth	Rivet Tilt
				Depth	Area		
Fig 1 9 (1 and 23) 2 2	Skin						
	Zone D4	1	0.0006	0.0006	100%	2	8
	Zone C3	1	0.0006	0.0006	100%	2	8
	Zone B3						
	Zone 01	1	0.0006	0.0006	100%	2	8
	Zone 02	1	0.0006	0.0006	100%	2	8
	Zone 03	1	0.0006	0.0006	100%	2	8
	Zone A2						
	Zone 02	1	0.002	0.002	100%	2	8
	Zone 04	1	0.002	0.002	100%	2	8
Fig 1 (2)	Seal Zone A2	0.071	0.002	0.002	2.50	0.025	10%
Fig 1 (3)	Seal Zone B3	0.080	0.0006	0.0006	1.50	0.025	8
Fig 1 (6)	Support Zone A2	0.100	0.002	0.002	2.50	0.032	10%
Fig 1 (8) 6	Spar						
	Zone D4	1	0.0006	0.0006	100%	8	8
	Zone D3	1	0.0006	0.0006	100%	8	8
	Zone C3	1	0.0006	0.0006	100%	8	8
	Zone B3	1	0.0006	0.0006	100%	8	8
	Zone A3						
	Zone 01	1	0.002	0.002	100%	8	8
	Zone 02	1	0.002	0.002	3	8	8
Fig 1 (17)	Seal Zone B3	0.080	0.0006	0.0006	1.50	0.025	8
Fig 1 (21)	Seal Zone A2	0.080	0.002	0.002	2.50	0.025	10%
Fig 1 (22)	Support Zone A2	0.080	0.002	0.002	2.50	0.025	10%
Fig 1 (26 and 28)	Plate						
	Zone C3	0.090	4	4	4	4	8
	Zone B3	0.090	4	4	4	4	8
	Zone A2	0.090	4	4	7	4	8

Table 1. Negligible Damage Limits (Continued)

Fig No Idx No	Nomen/ Repair Zone	Thickness	Scratch Depth	Nicks Gouges		Dents Depth	Rivet Tilt
				Depth	Area		
Fig 1  (27)	Cap						
	Zone C3	0.016	0.0006	0.0006	100%		
	Zone B3	0.016	0.0006	0.0006	100%		
	Zone A2	0.016	0.002	0.002			
Fig 1 (31)	Plate Zone A1	0.032	0.004	0.004	4.50	0.016	10%
Fig 1 (33)	Rib Zone A1	0.032	0.004	0.004	4.50	0.016	10%
Fig 1 (34)	Plate Zone A1	0.032	0.004	0.004	3.00	0.016	10%
Fig 1 (35)	Rib Zone A1	0.032	0.004	0.004	3.00	0.016	10%

NOTES

- 1 ▢ Various thickness.
- 2 ▢ See figure 4, detail D.
- 3 ▢ 1.25 square inches total combined area allowed with one pocket.
- 4 ▢ See figure 4, detail F.
- 5 ▢ 1.20 square inches combined area contained within any 30 inch length.
- 6 ▢ See figure 4, detail E.
- 7 ▢ 5.0 square inches combined total area allowed in zone.
- 8 ▢ None allowed.
- 9 ▢ Remove segment of damaged or undamaged polyurethane tape to determine allowable damage limits to assembly.

Table 2. Repairable Damage Limits After Blending

Fig No Idx No	Nomen/ Repair Zone	Thickness	Edge Nicks Depth	Scratch Depth	Nicks Gouges		Corrosion	
					Depth	Area	Depth	Area
Fig 1 22 (1 and 23) 21 21 15 21 21 15 4 4	Skin Zone D4 Zone C3 Zone B3 Zone 01 Zone 03 Zone A2 Zone 02 Zone 04	 1 1 1 1 1 1	 0.0006 0.008 0.0006 0.008 0.0005 0.015	 0.0006 0.008 0.0006 0.008 0.005 0.015	 0.0006 0.008 0.0006 0.008 0.005 0.015	 100% 2 100% 2 3 5	 0.0006 0.008 0.0006 0.008 0.005 0.015	 100% 2 100% 2 3 5
Fig 1 (2) 10	Seal Zone A2	0.071	0.010	0.010	0.010	9	0.010	9
Fig 1 (3) 21	Seal Zone B3	0.080	0.010	0.010	0.010	11	0.010	11
Fig 1 (6) 10	Support Zone A2	0.100	0.013	0.013	0.013	9	0.013	9
Fig 1 (8) 21 21 21 16 7 21 16 7 21	Spar Zone D4 Zone D3 Zone C3 Zone B3 Zone 02 Zone 03 Zone A3 Zone 02 Zone 03	 1 1 1 1 1 1 1	 0.0006 0.0006 0.0006 0.012 0.016 0.012 0.016	 0.0006 0.0006 0.0006 0.012 0.016 0.012 0.016	 0.0006 0.0006 0.0006 0.012 0.016 0.012 0.016	 100% 100% 100% 6 8 6 8	 0.0006 0.0006 0.0006 0.012 0.016 0.012 0.016	 100% 100% 100% 6 8 6 8
Fig 1 (17) 21	Seal Zone B3	0.080	0.011	0.011	0.011	11	0.011	11
Fig 1 (21) 10	Seal Zone A2	0.080	0.011	0.011	0.011	9	0.011	9
Fig 1 (22) 10	Support Zone A2	0.080	0.011	0.011	0.011	9	0.011	9
Fig 1 (26 and 28) 14 14 14	Plate Zone C3 Zone B3 Zone A2	 0.090 0.090 0.090	 14 14 14	 14 14 14	 14 14 14	 20 20 19	 14 14 14	 20 20 19

Table 2. Repairable Damage Limits After Blending (Continued)

Fig No Idx No	Nomen/ Repair Zone	Thickness	Edge Nicks Depth	Scratch Depth	Nicks Gouges		Corrosion	
					Depth	Area	Depth	Area
Fig 1 (27) 22 18 18 18	Cap							
	Zone C3	0.016	0.003	0.003	0.003	17	0.003	17
	Zone B3	0.016	0.003	0.003	0.003	17	0.003	17
	Zone A2	0.016	0.003	0.003	0.003	17	0.003	17
Fig 1 (31) 10	Plate Zone A1	0.032	0.007	0.007	0.007	12	0.007	12
Fig 1 (33) 10	Rib Zone A1	0.032	0.007	0.007	0.007	12	0.007	12
Fig 1 (34) 10	Plate Zone A1	0.032	0.007	0.007	0.007	13	0.007	13
Fig 1 (35) 10	Rib Zone A1	0.032	0.007	0.007	0.007	13	0.007	13

NOTES

- 1 Various thickness.
- 2 12.0 square inches combined total within zone, no more than 3.0 square inches in any 12.0 inch diameter.
- 3 9.0 square inches combined total within zone, no more than 3.0 square inches in outboard section.
- 4 0.25 inch diameter hole, must be 1.0 inch from any chem mill step and 0.5 inches from any edge of part.
- 5 2.5 square inches combined total within zone.
- 6 7.0 square inches combined total area allowed in one pocket.
- 7 0.25 inch diameter hole must be 1.0 inch from spar and 0.75 inch from vertical stiffener. Hole must be plugged/sealed.
- 8 10.0 square inches combined total area allowed in one pocket.
- 9 4.0 square inches combined total allowed on the part.
- 10 0.25 inch diameter hole, must be 0.50 from any edge and 0.75 inches from any fastener.
- 11 2.5 square inches combined total allowed on the part.
- 12 6.0 square inches combined total allowed on the part.
- 13 4.5 square inches combined total allowed on the part.
- 14 See figure 4, detail F.
- 15 See figure 4, detail D.
- 16 See figure 4, detail E.
- 17 1.8 square inches total combined area contained within zone.
- 18 0.25 inch diameter hole, must be 0.38 inches from any edge. Hole must be plugged/sealed. Check nose piece for delamination.
- 19 7.0 square inches combined total area allowed in zone.
- 20 10.0 square inches combined total area allowed.
- 21 No holes allowed.
- 22 Remove segment of damaged or undamaged polyurethane tape to determine allowable damage limits to assembly.

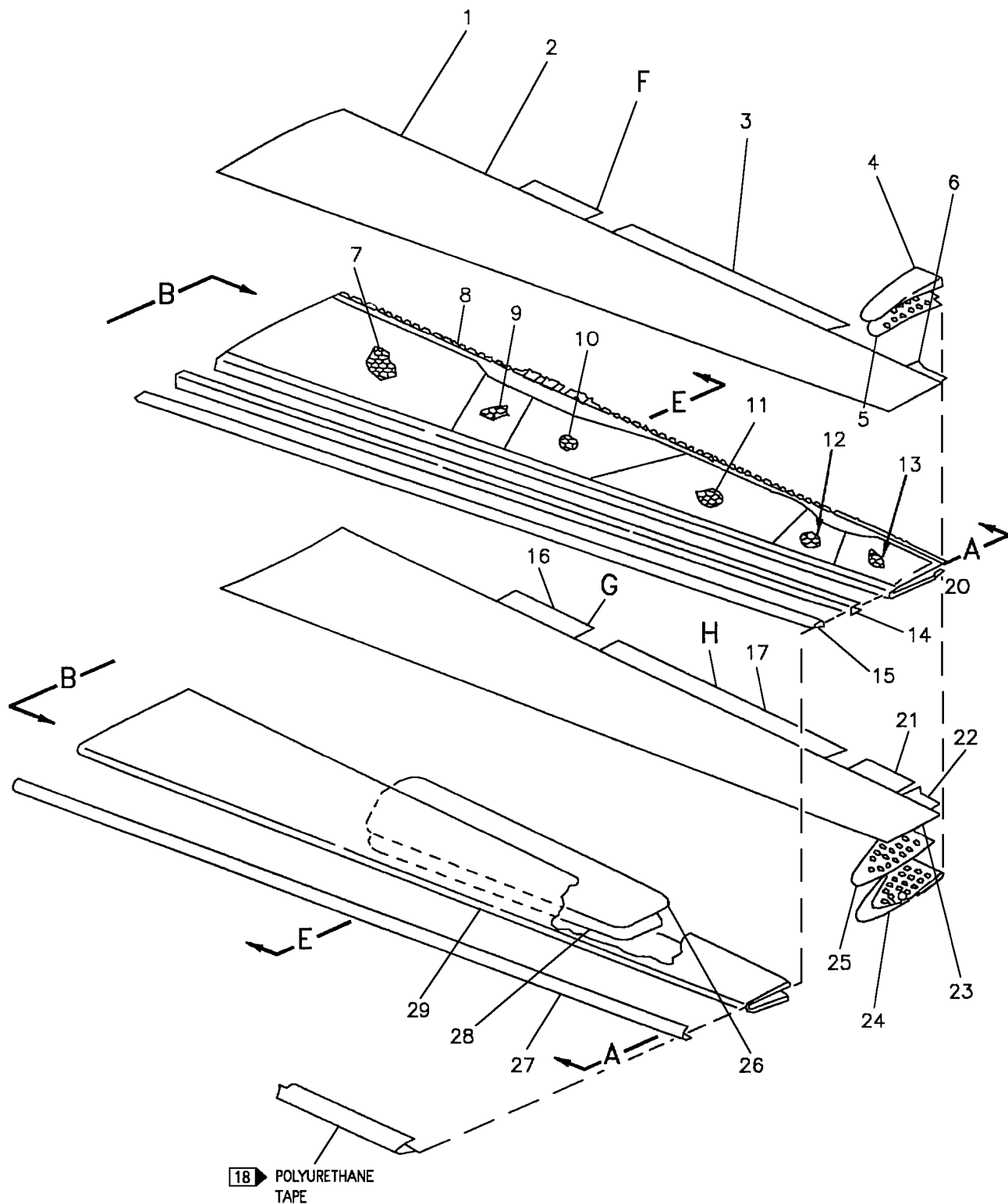


Figure 1. Material Index (Sheet 1)

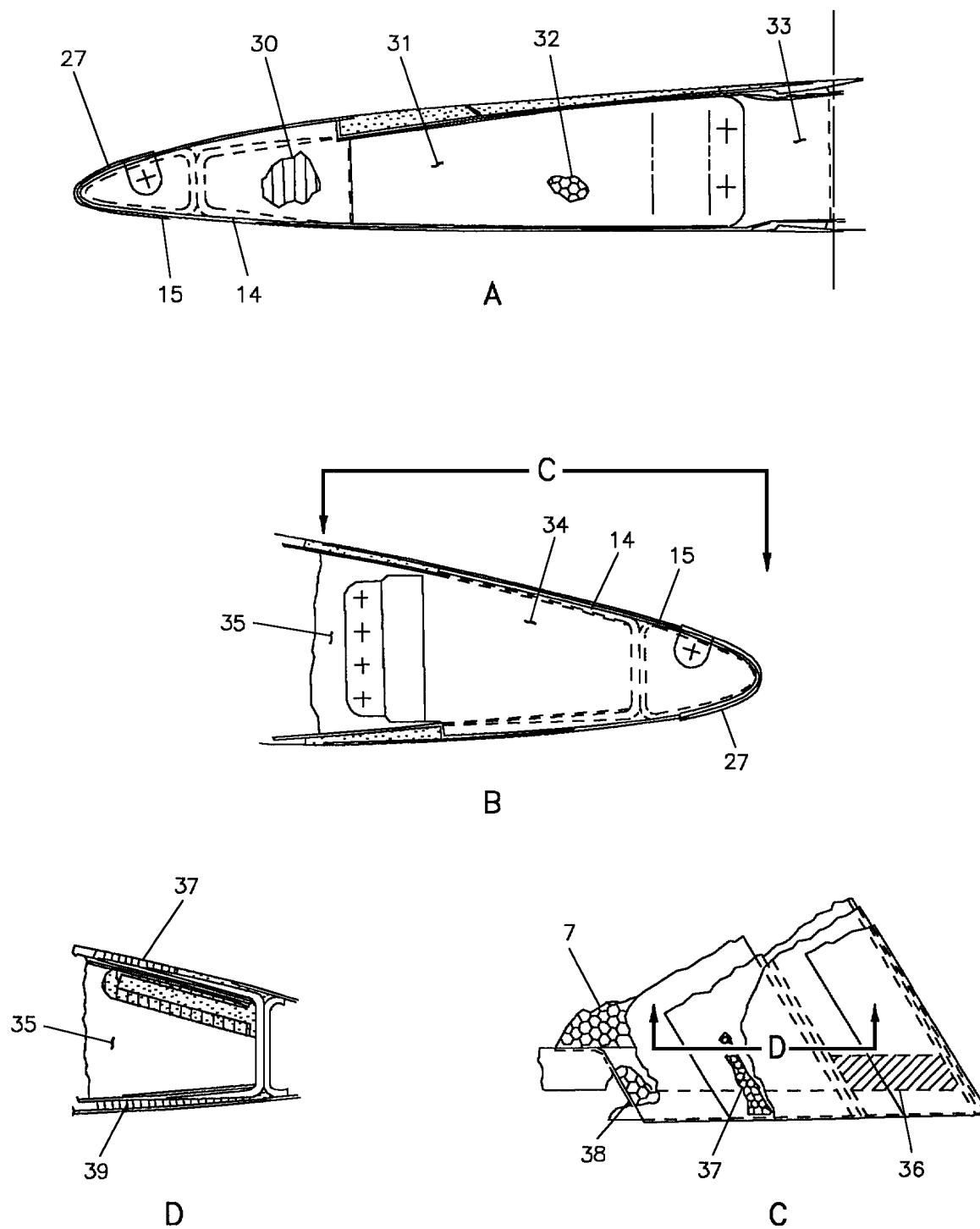
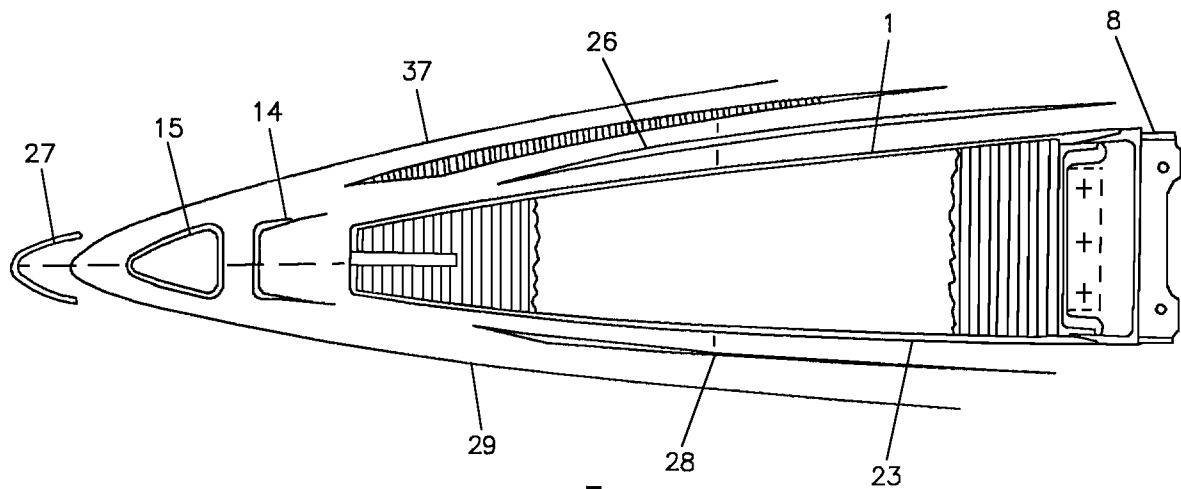
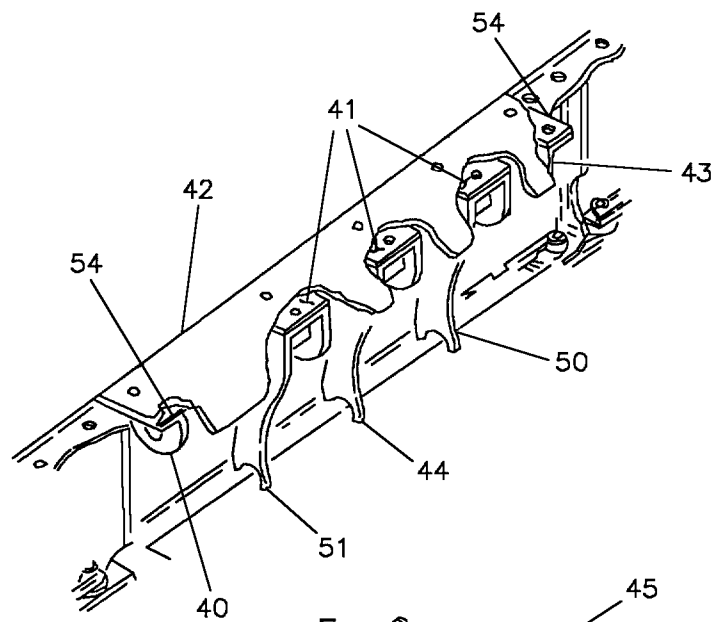


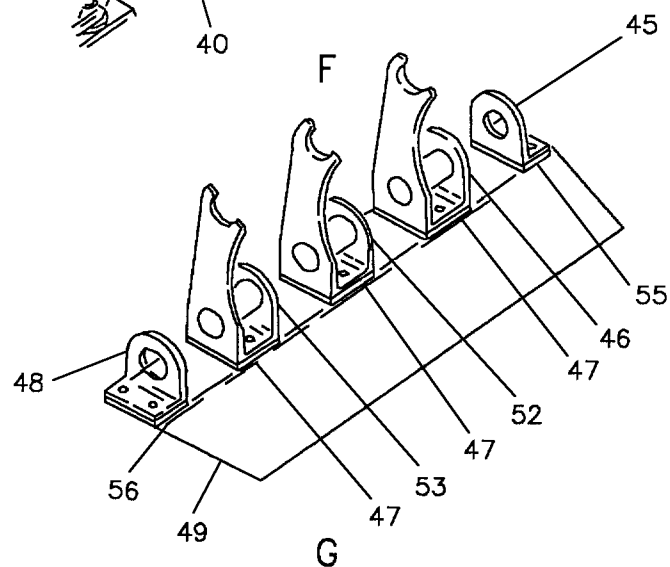
Figure 1. Material Index (Sheet 2)



E



F



G

Figure 1. Material Index (Sheet 3)

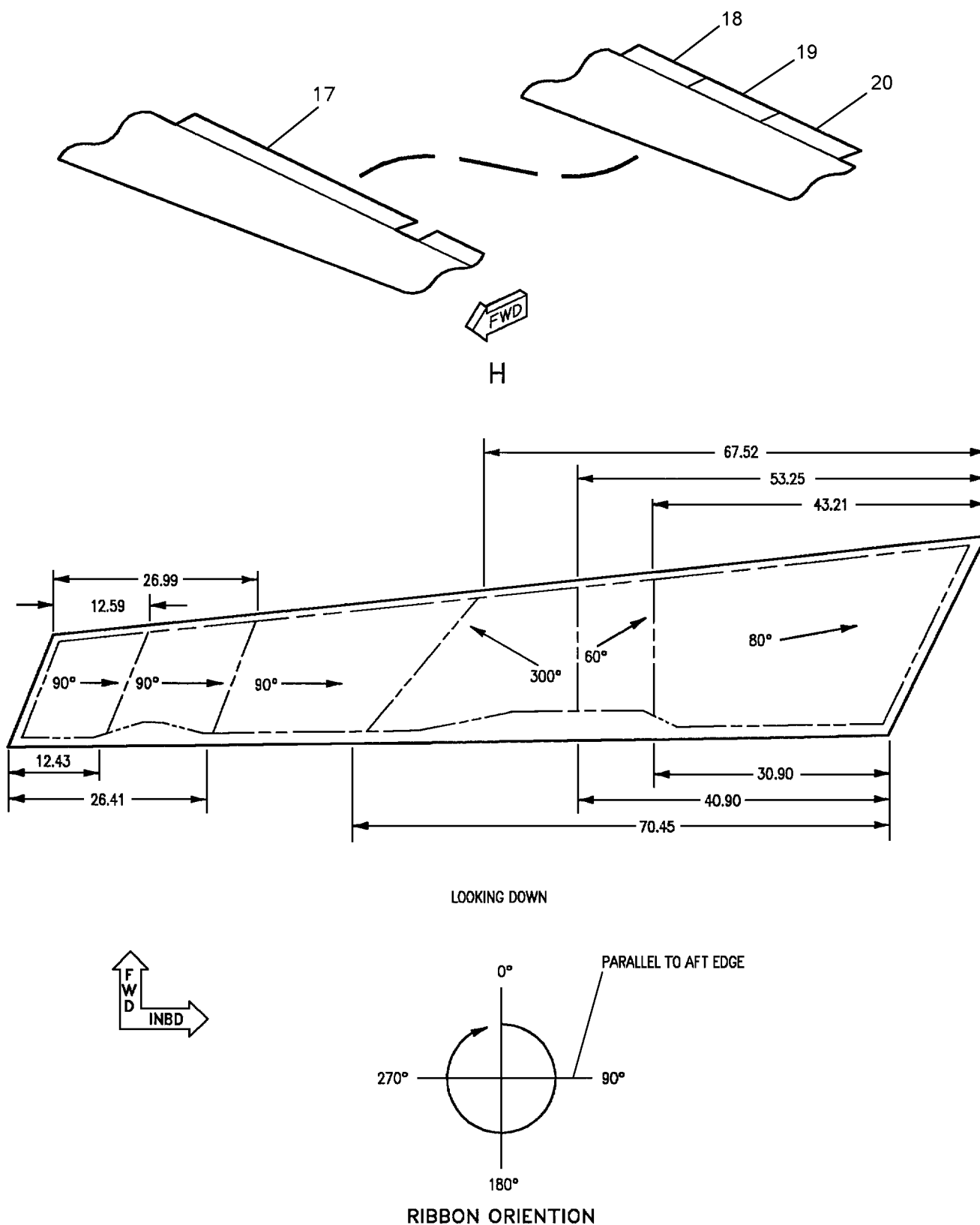


Figure 1. Material Index (Sheet 4)


















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2		Seal 74A190650-2003, -2004	 0.071 Sheet	7075-T6 Alclad
3		Seal 74A190627-2005, -2006	 0.080 Sheet	7075--T6 Alclad
4		Skin 74A190710-2001, -2002	0.060 Sheet	
5		Pan 74A190710-2003, -2004	0.060 Sheet	
6		Support 74A190632-2001, -2002	 0.100 Sheet	7075-T76 Alclad
7		Core 74A190652-2001, -2002		5056-H39 Al Aly
8		Spar 74A190654-2003, -2004	Machining	7050-T736 Al Aly
9		Core 74A190652-2003, -2004		5056-H39 Al Aly
10		Core 74A190652-2005, -2006		5056-H39 Al Aly
11		Core 74A190652-2007, -2008		5056-H39 Al Aly
12		Core 74A190652-2013, -2014		5056-H39 Al Aly
13		Core 74A190652-2015, -2016		5056-H39 Al Aly
14		Closure 74A190663-2009, -2010	0.120 Sheet	
15		Nosepiece 74190663-2015, -2016	0.100 Sheet	
16		Seal 74A190616-2007, -2008	0.112 Sheet	6AL-4V Ti Anl
17		Seal 74A190617-2003, -2004	 0.080 Sheet	7075-T76 Alclad
18		Seal 74A190617-2013, -2014	0.080 Sheet	7075-T6 Alclad

Figure 1. Material Index (Sheet 5)









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20		Seal 74A190617-2017, -2018	0.080 Sheet	7075-T6 Alclad
21		Seal 74A190623-2005, -2006	 0.080 Sheet	7075-T6 Alclad
22		Support 74A190632-2003, -2004	 0.080 Sheet	7075-T76 Alclad
23		Skin 74A190651-2003, -2004	0.250 Plate	7075-T76 Alclad
24		Skin 74A190714-2001, -2002	0.060 Sheet	
25		Pan 74A190714-2003, -2004	0.060 Sheet	
26		Plate 74A190615-2005, -2006	0.090 Sheet	7075-T76
27		Cap 74A190663-2019, -2020	0.016 Sheet	6061-T6 Al Aly
28		Plate 74A190615-2007, -2008	0.090 Sheet	7075-T76
29		Skin 74A190663-2017, -2018	0.030 Sheet	
30		Core 74A190634-2007, -2008		5056-H39 Al Aly
31		Plate 74A190663-2011, -2012	0.032 Sheet	7075-T6 Alclad

Figure 1. Material Index (Sheet 6)











Idx No.	Eft	Nomenclature and Part No.	Description	Material
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33		Rib 74A190611-2005, -2006	0.032 Sheet	7075-T6 Alclad
34	 	Plate 74A190663-2013, -2014 74A190663-2033, -2034	0.032 Sheet	7075-T6 Alclad
35		Rib 74A190610-2003, -2004	0.032 Sheet	7075-T6 Alclad
36		Core 74A190663-2035, -2036		5056-H39 Al Aly
37		Core, Upper 74A190663-2021, -2022		5056-H39 Al Aly
38	 	Core 74A190634-2005, -2006 74A190634-2017, -2018		5056-H39 Al Aly
39		Core, Lower 74A190663-2023, -2024		5056-H39 Al Aly
40		Support 74A190677-2019, -2020	1MA100D06-10375 Extrusion	7075-T76511 Al Aly
41		Shim 74A190678-2003	0.032 Sheet	5052-H39 Al Lam
42		Seal 74A190618-2005, -2006	0.071 Sheet	7075-T6 Alclad
43		Support 74A190677-2015, -2016	1MA100D06-10375 Extrusion	7075-T76511 Al Aly

Figure 1. Material Index (Sheet 7)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
44		Support 74A190677-2009, -2010	1MA120D06-10309 Extrusion	7075-T76511 Al Aly
45		Support 74A190677-2013, -2014	1MA100D06-10375 Extrusion	7075-T76511 Al Aly
46		Support 74A190677-2005, -2006	1MA120D06-10308 Extrusion	7075-T76511 Al Aly
47		Shim 74A190678-2001	0.032 Sheet	5052-H39 Al Lam
48		Support 74A190677-2017, -2018	1MA100D06-10375 Extrusion	7075-T76511 Al Aly
49	19	Seal 74A190616-2007, -2008	0.112 Sheet	6AL-4V Ti Anl
50		Support 74A190677-2011, -2012	1MA120D06-10309 Extrusion	7075-T76511 Al Aly
51		Support 74A190677-2007, -2008	1MA120D06-10309 Extrusion	7075-T76511 Al Aly
52		Support 74A190677-2003, -2004	1MA120D06-10308 Extrusion	7075-T76511 Al Aly
53		Support 74A190677-2001, -2002	1MA120D06-10308 Extrusion	7075-T76511 Al Aly
54		Shim 74A190678-2007	0.032 Sheet	5052-H39 Al Lam

Figure 1. Material Index (Sheet 8)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
55		Shim 74A190678-2005	0.032 Sheet	5052-H39 Al Lam
56		Shim 74A190678-2009	0.032 Sheet	5052-H39 Al Lam
<p style="text-align: center;">LEGEND</p> <p>1 Tapers from 0.071 leading edge to 0.030 trailing edge.</p> <p>2 Tapers from 0.080 leading edge to 0.030 trailing edge.</p> <p>3 Leading edge is 0.100, trailing edge is 0.030.</p> <p>4 Leading edge is 0.080, trailing edge is 0.030.</p> <p>5 3/16 hex cell 0.0010 nonperforated honeycomb.</p> <p>6 3/16 hex cell 0.0020 nonperforated honeycomb.</p> <p>7 3/16 hex cell 0.0015 nonperforated honeycomb.</p> <p>8 1/8 hex cell 0.0020 nonperforated honeycomb.</p> <p>9 5/32 hex cell 0.0010 nonperforated honeycomb.</p> <p>10 Fiberglass reinforced plastic laminate.</p> <p>11 0.80 x 0.0014 flex core.</p> <p>12 0.187 hex cell 0.0010 nonperforated honeycomb.</p> <p>13 Fiberglass reinforced plastic laminate of various thickness.</p> <p>14 Polycarbonate.</p> <p>15 0.32 thick by 80 cells per foot honeycomb.</p> <p>16 161353 THRU 161358.</p> <p>17 161359 THRU 161519.</p> <p>18 Polyurethane tape to protect leading edge finish. For application of polyurethane tape (A1-F18AC-SRM-500, WP027 00) Finish System.</p> <p>19 161353 THRU 161519 BEFORE F/A-18 AFC 27. AFTER F/A-18 AFC 27 PART IS REMOVED.</p> <p>20 BEFORE F/A-18 AFC 159.</p> <p>21 AFTER F/A-18 AFC 159.</p>				

Figure 1. Material Index (Sheet 9)

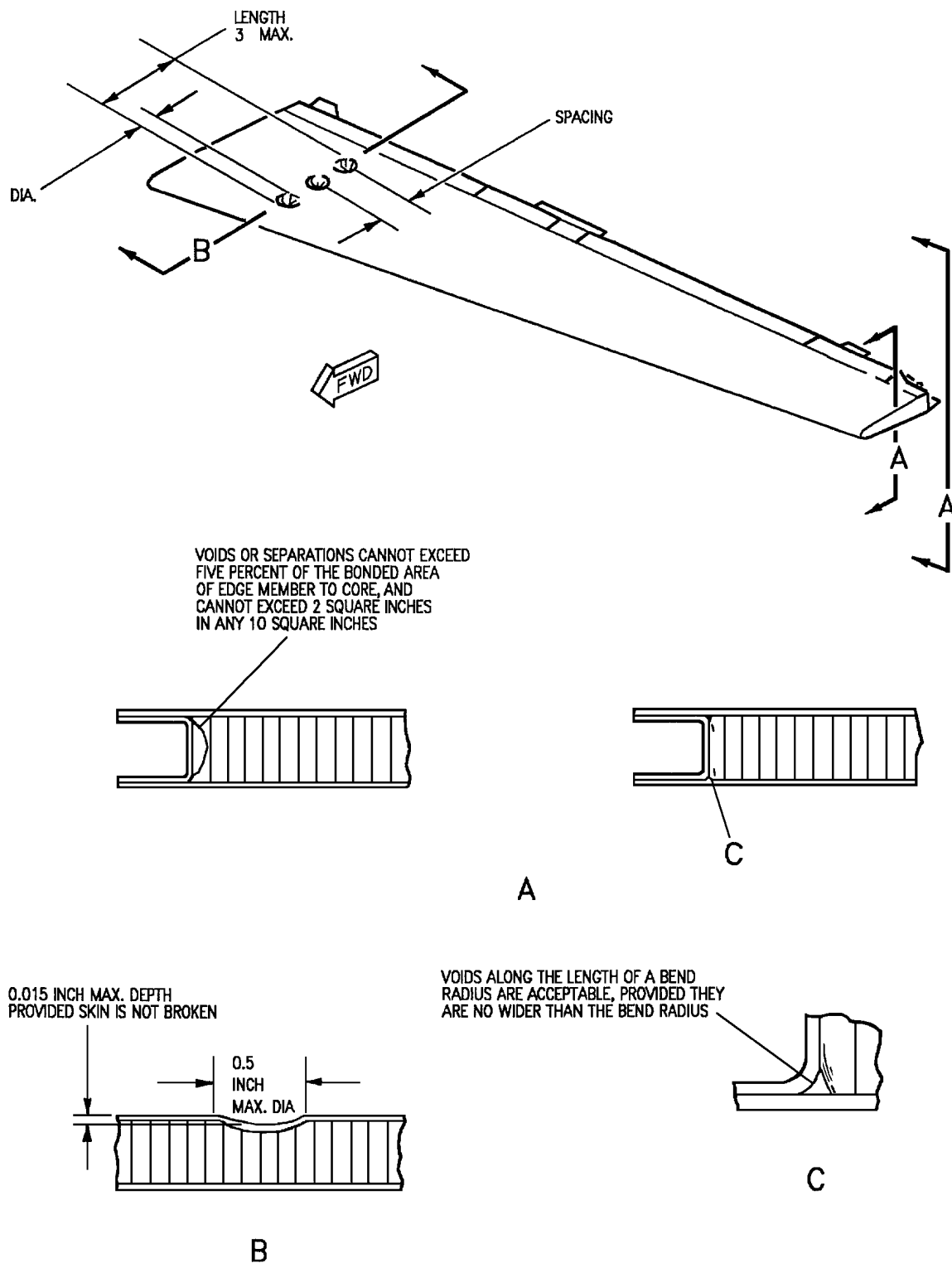
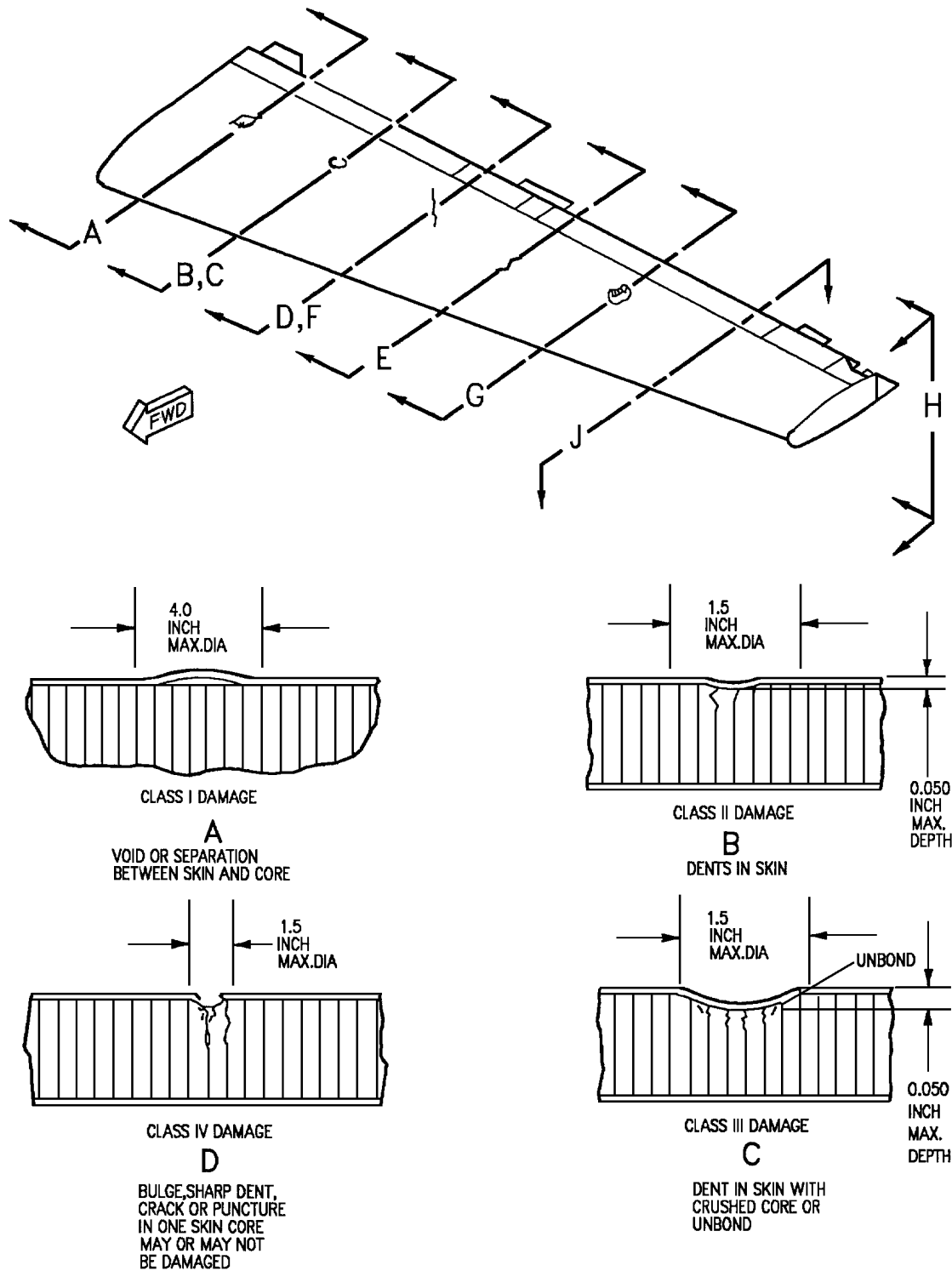


Figure 2. Negligible Damage, Aluminum Skin and Aluminum Honeycomb Core



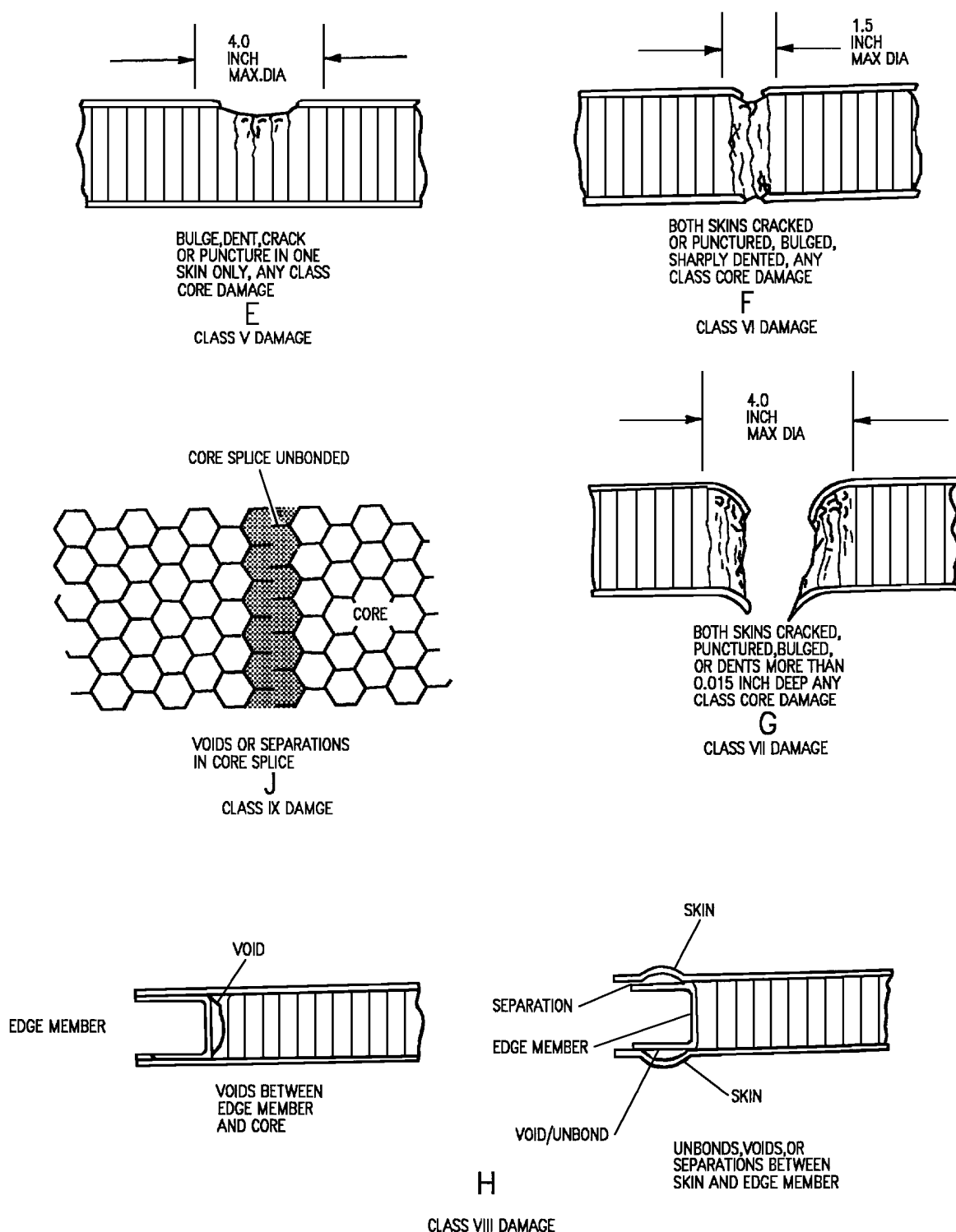


Figure 3. Repairable Damage, Aluminum Skin and Aluminum Honeycomb Core (Sheet 2)

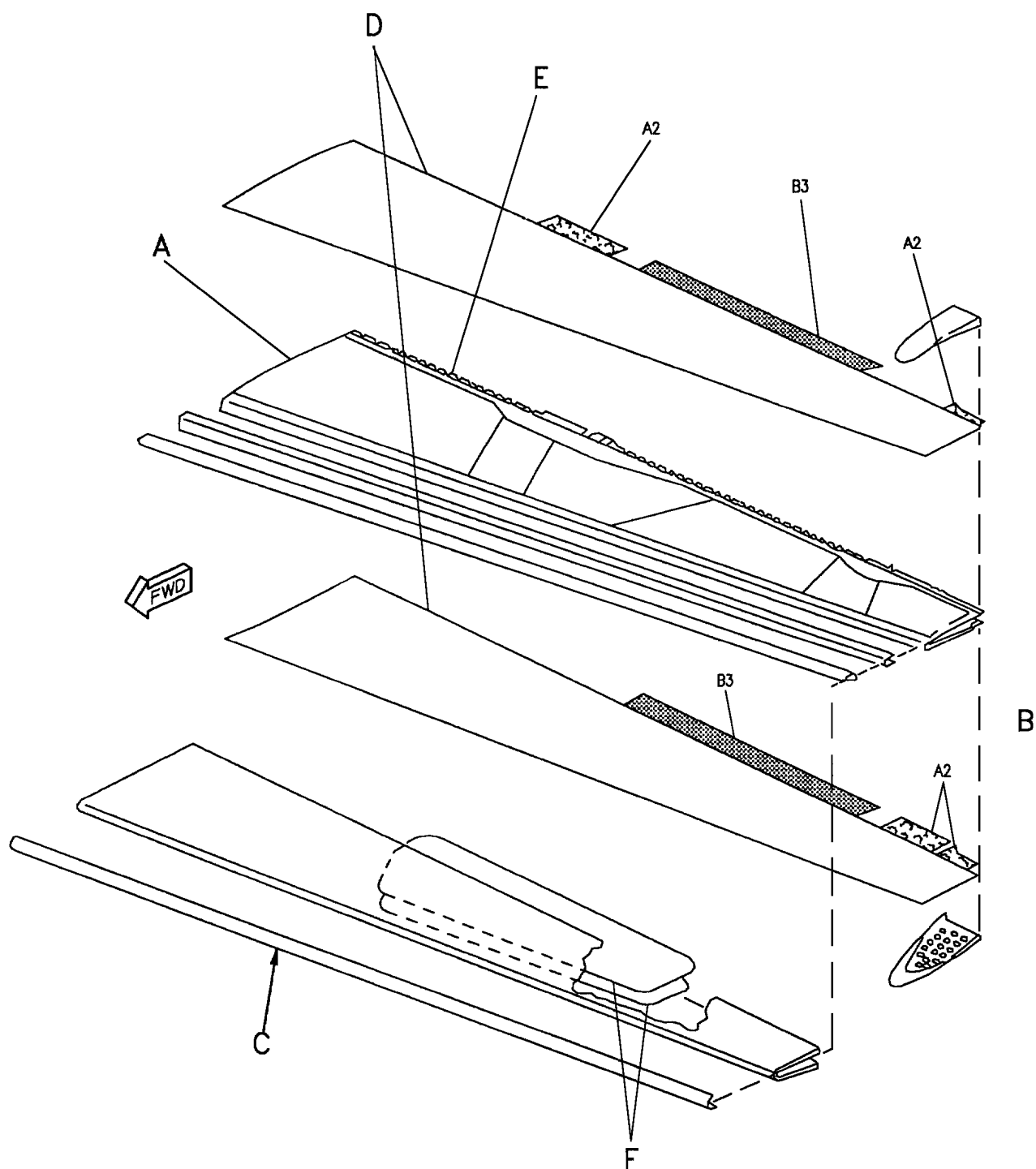


Figure 4. Repair Zones (Sheet 1)

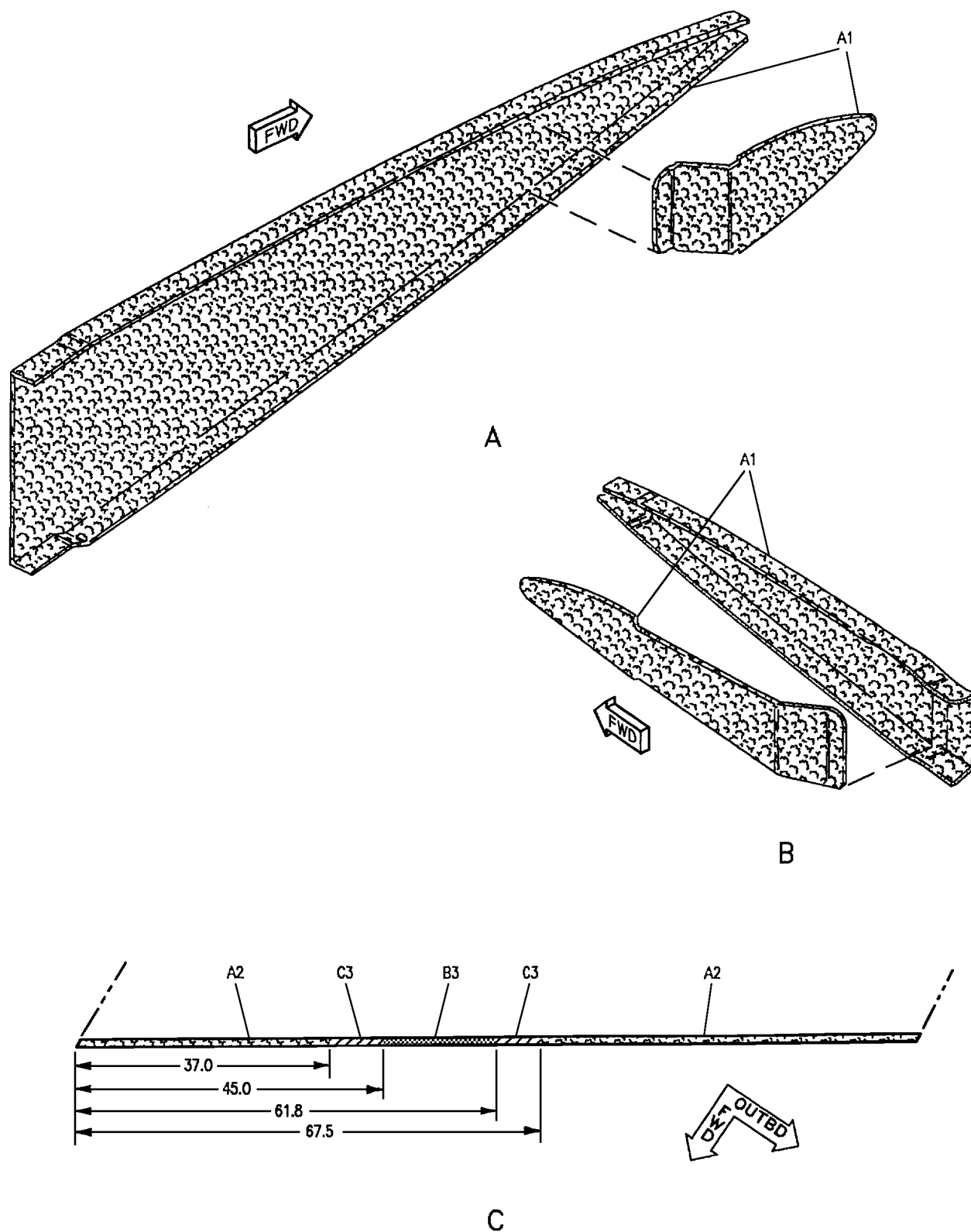
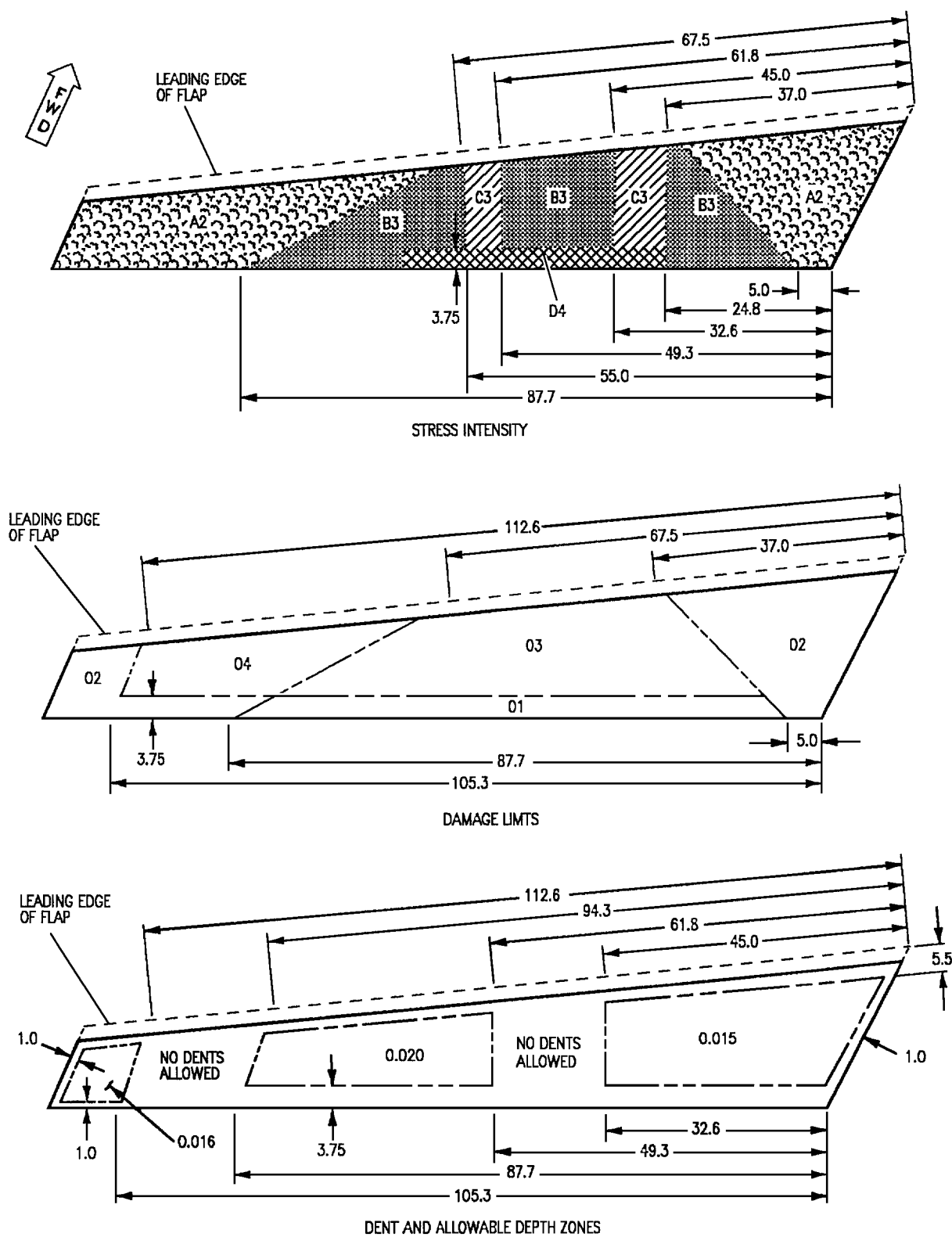


Figure 4. Repair Zones (Sheet 2)



A

Figure 4. Repair Zones (Sheet 3)

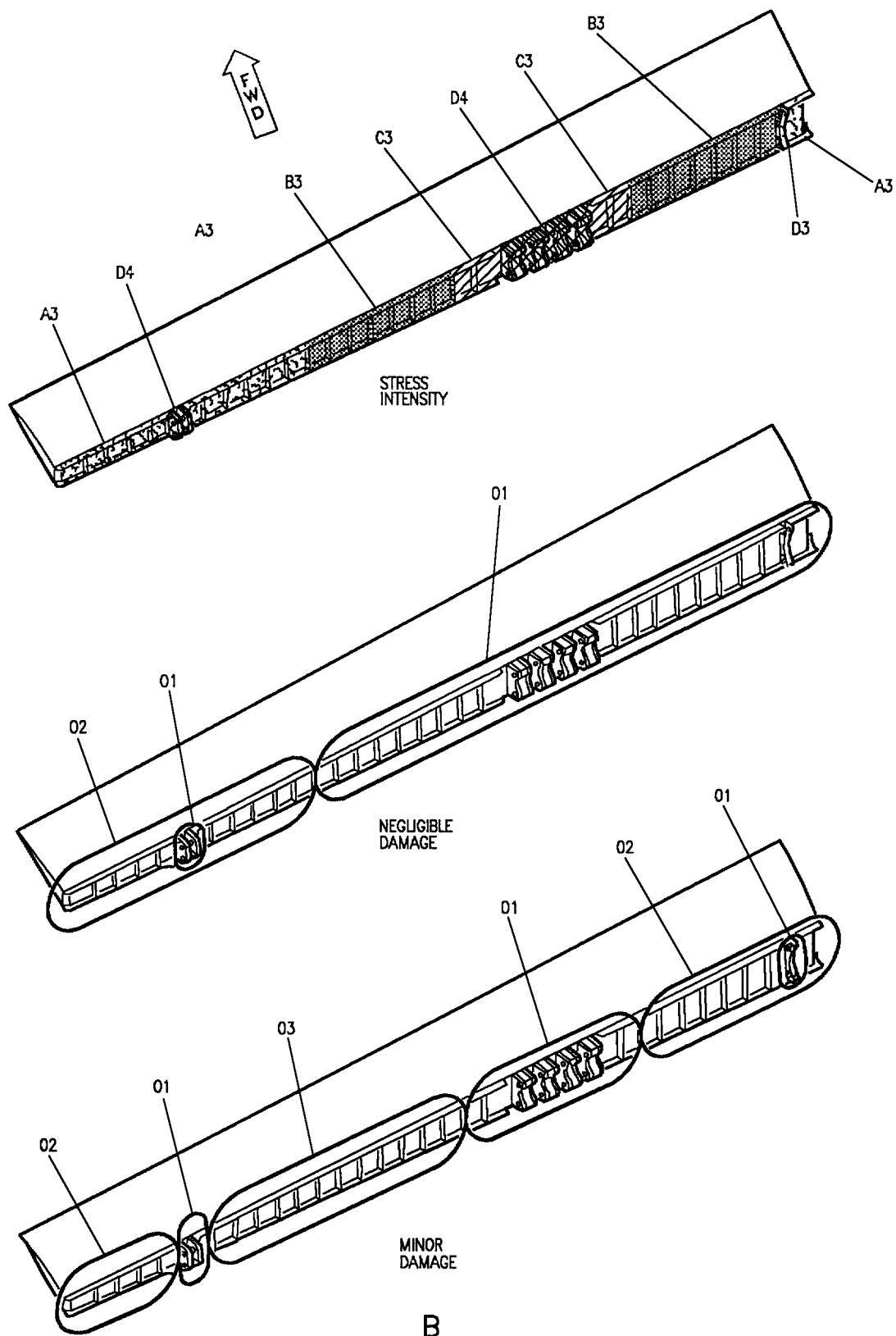
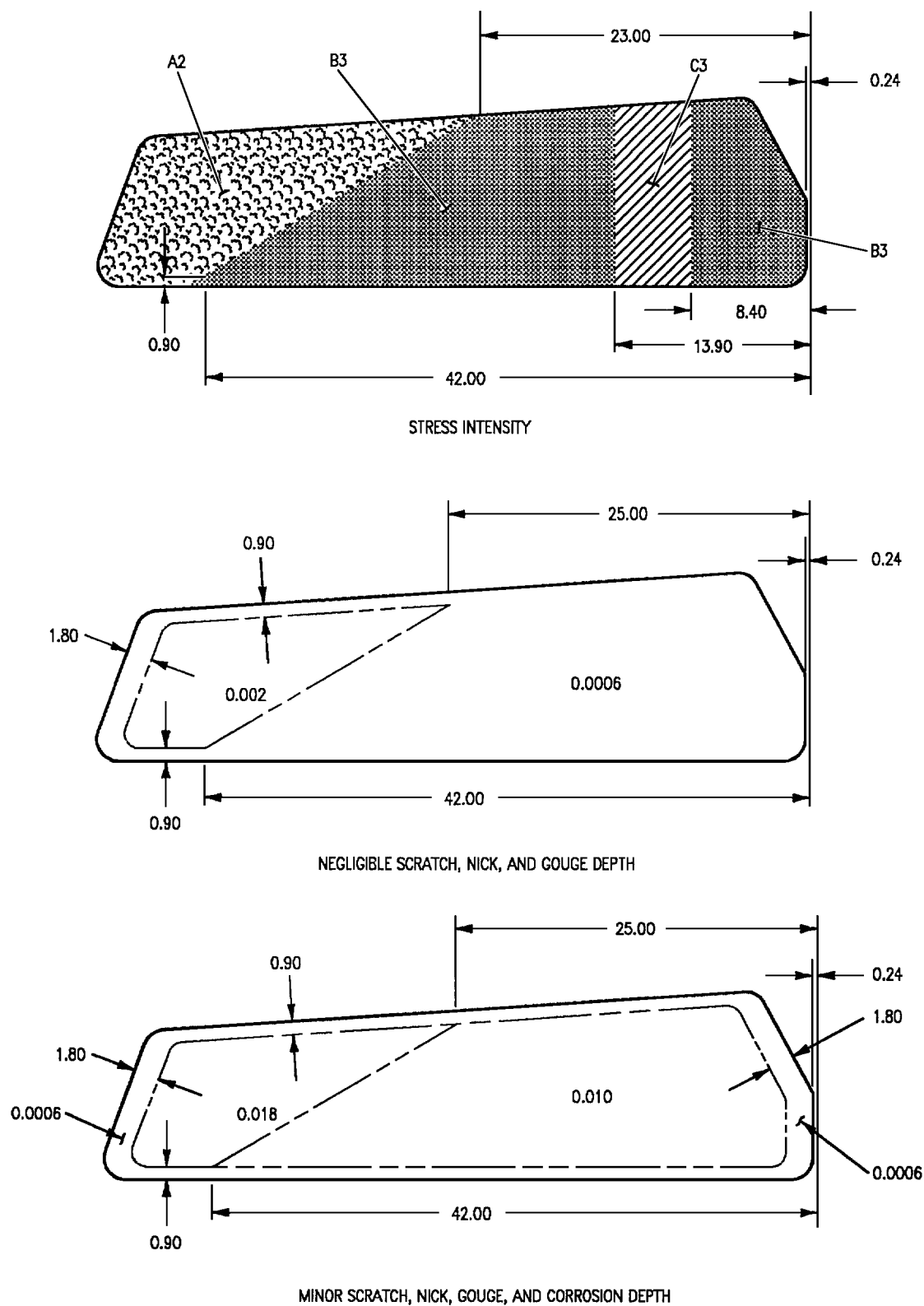
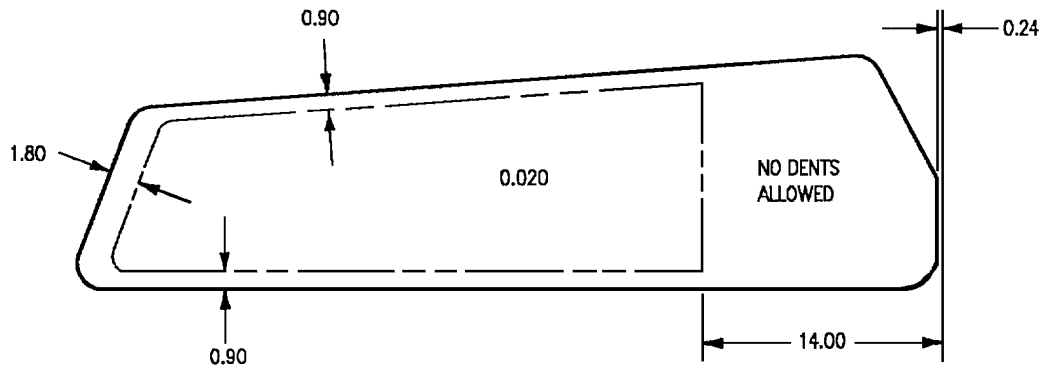


Figure 4. Repair Zones (Sheet 4)

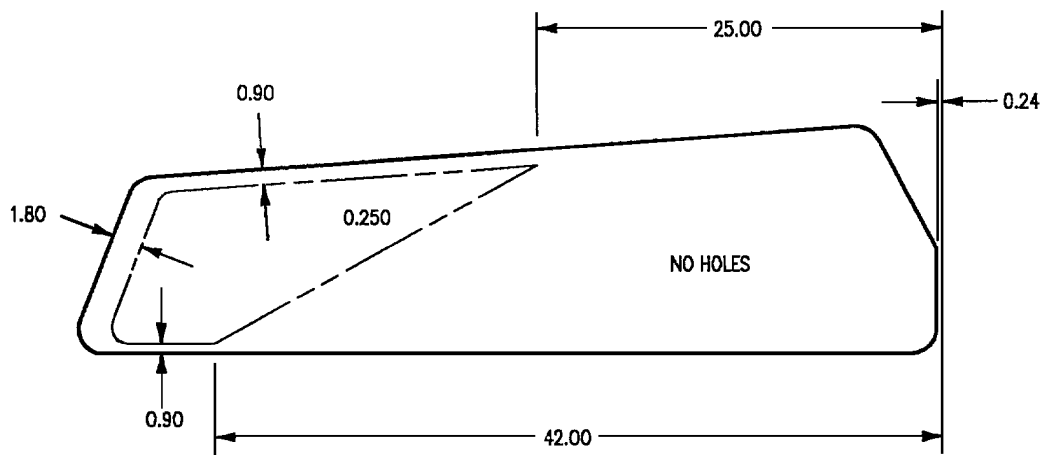


F

Figure 4. Repair Zones (Sheet 5)



DENT ZONES AND ALLOWABLE DEPTHS



HOLES-DIAMETER (INCHES)

F

Figure 4. Repair Zones (Sheet 6)

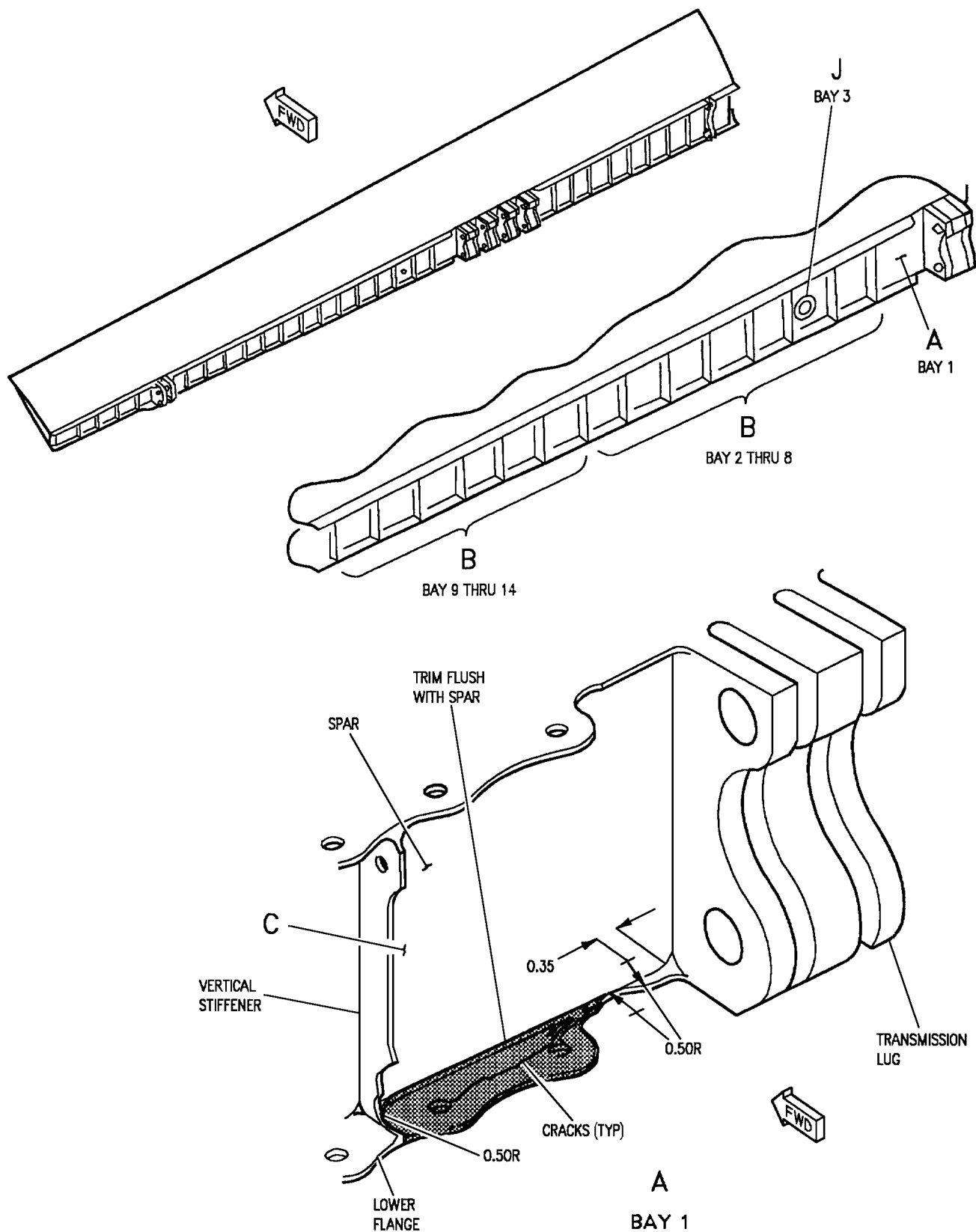


Figure 5. Spar Lower Flange Repair (Sheet 1)

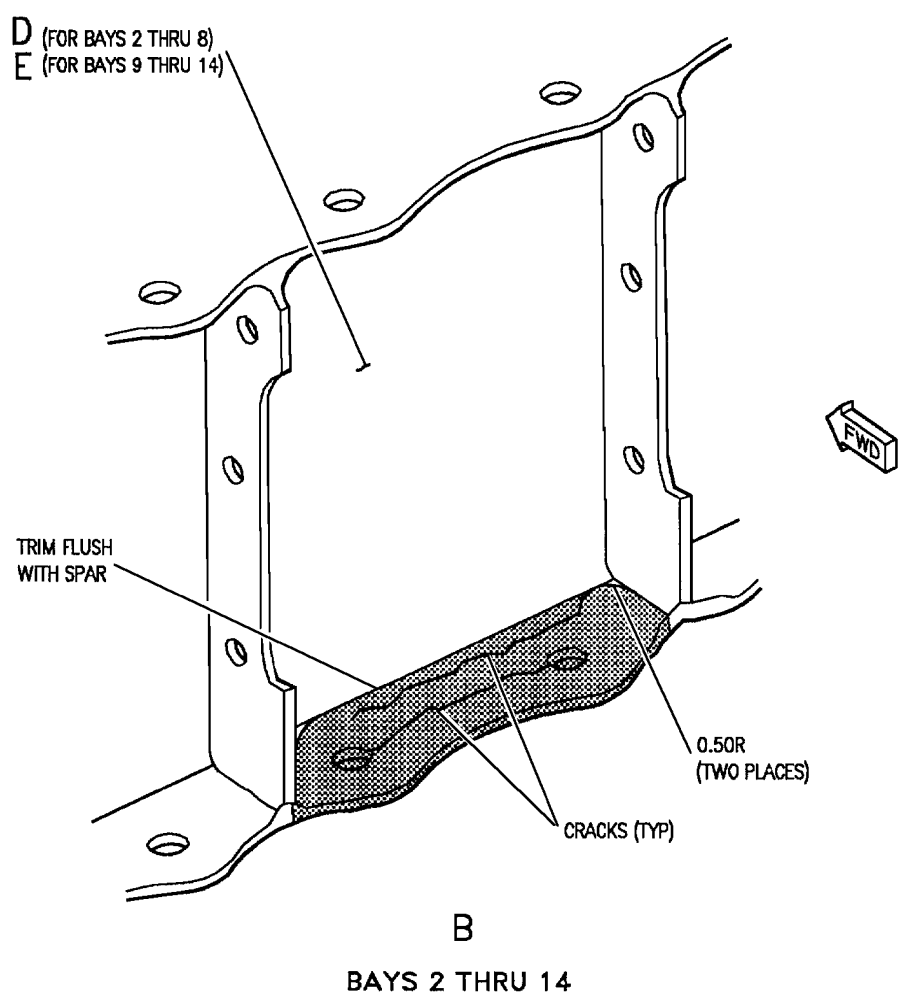


Figure 5. Spar Lower Flange Repair (Sheet 2)

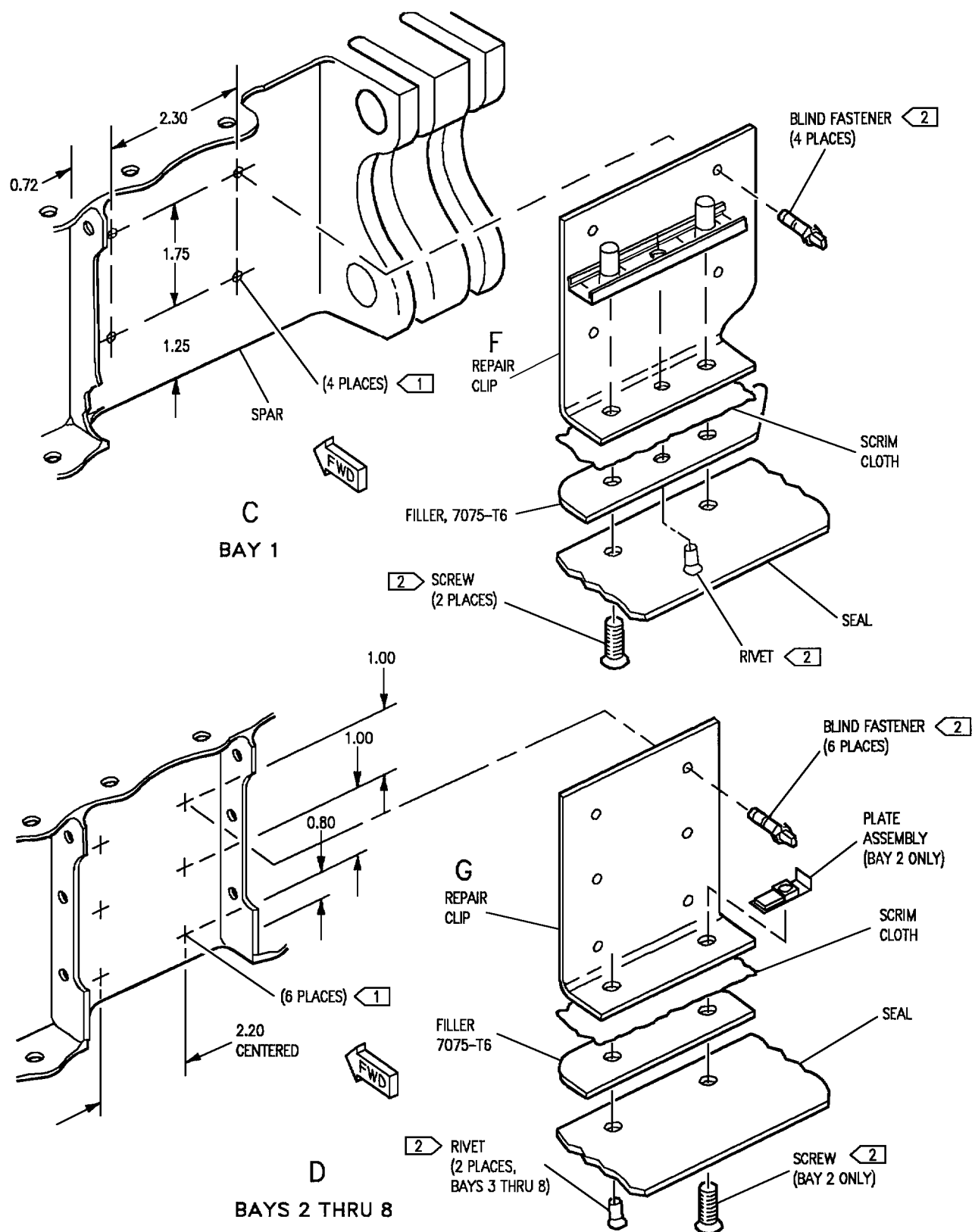


Figure 5. Spar Lower Flange Repair (Sheet 3)

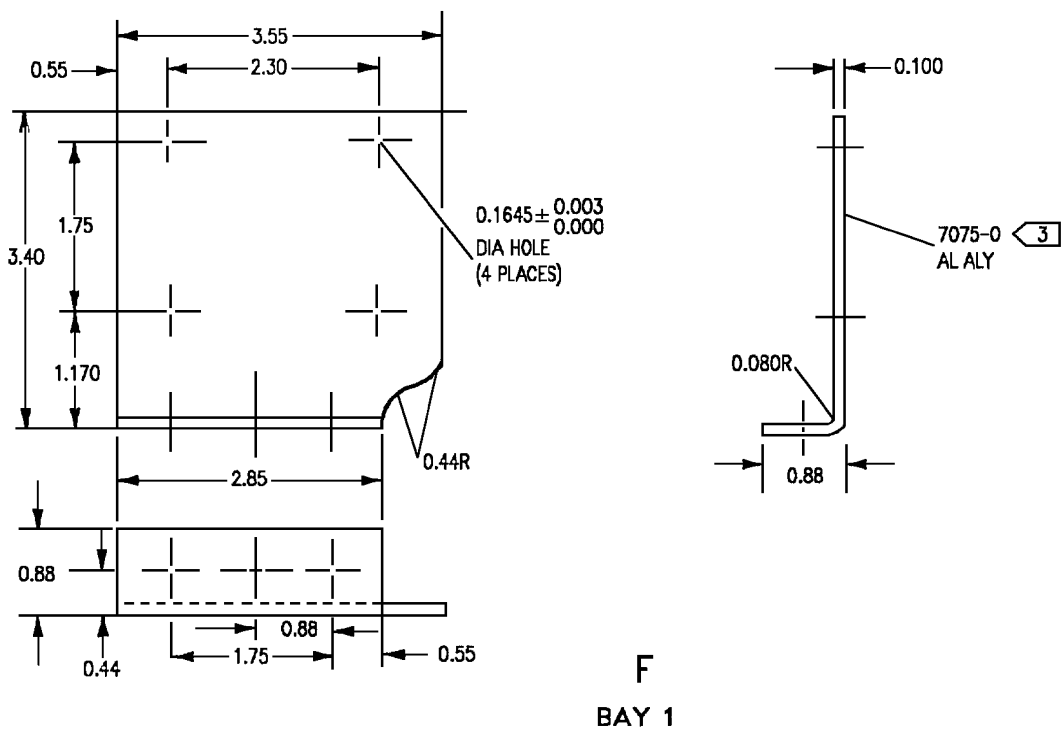
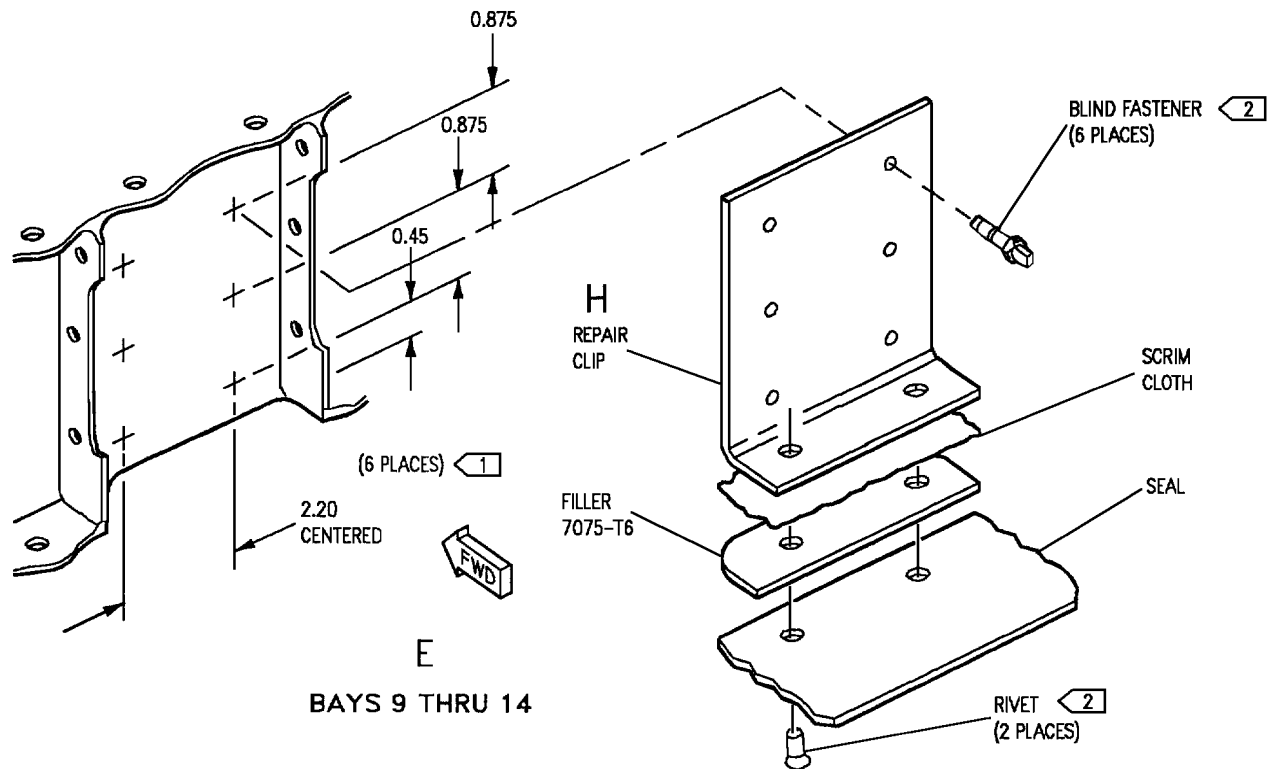
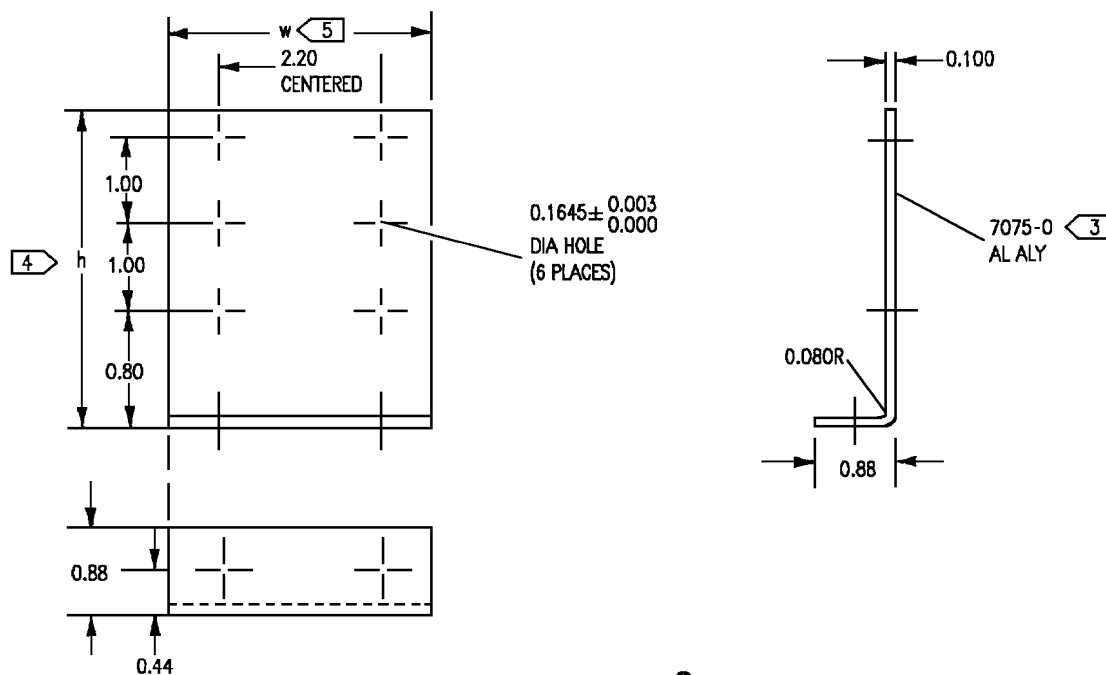
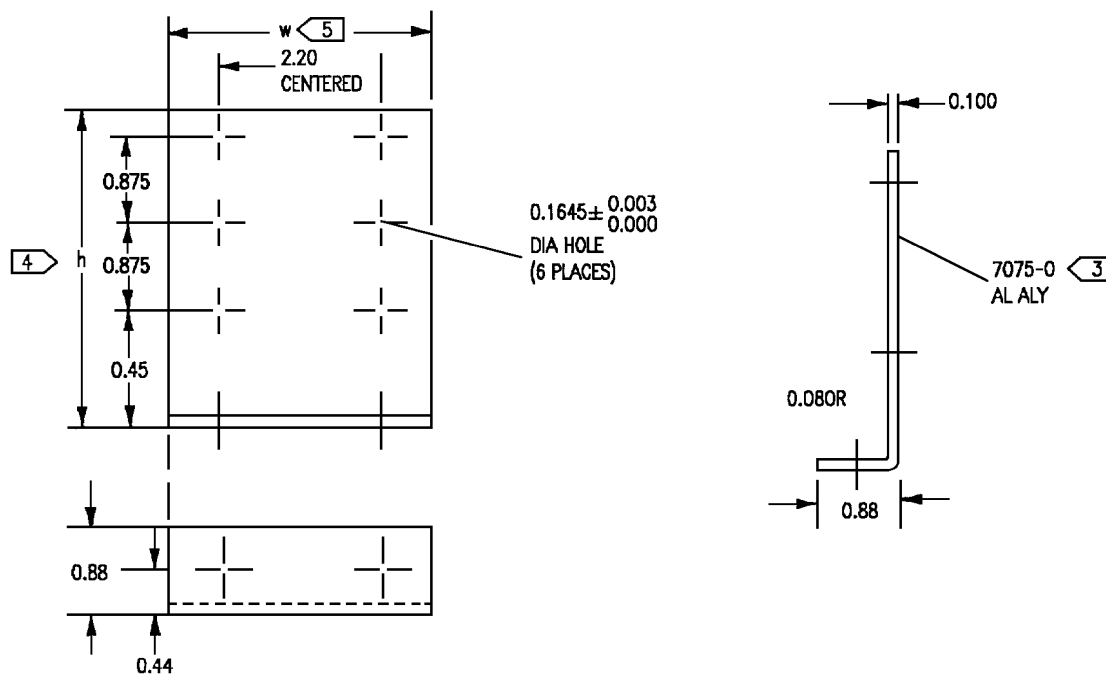


Figure 5. Spar Lower Flange Repair (Sheet 4)



G

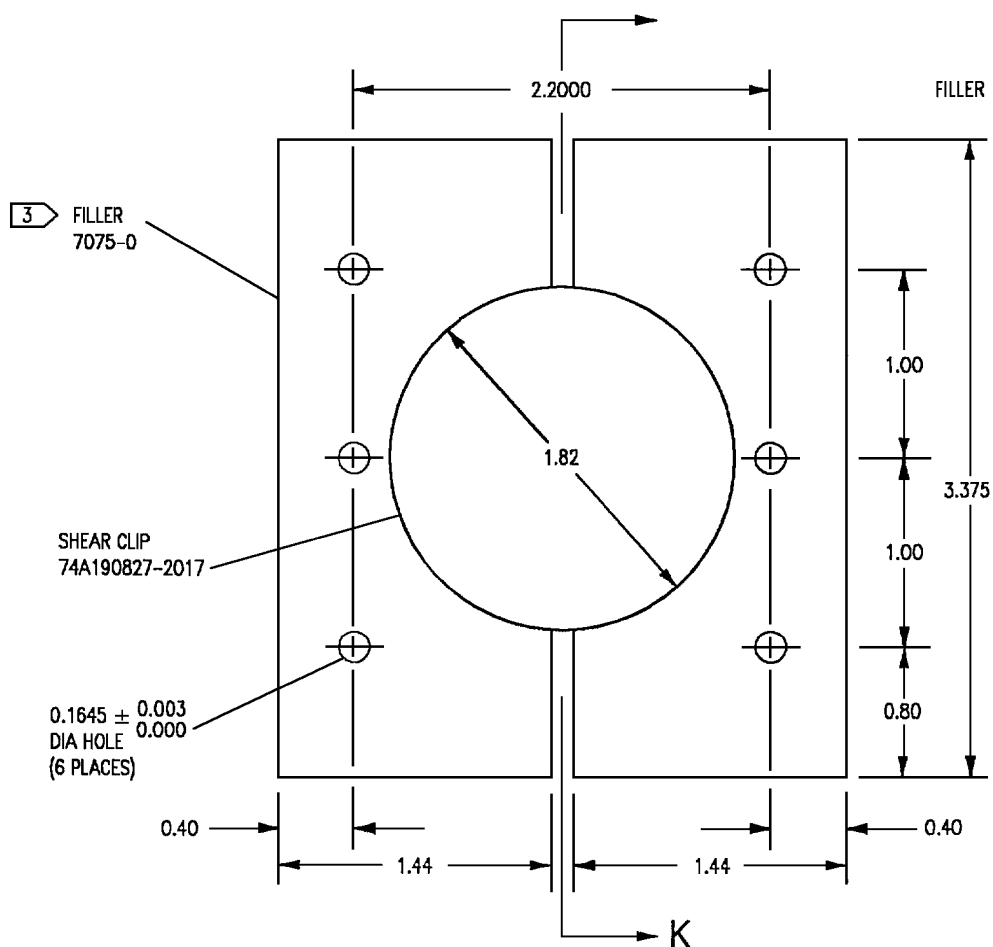
BAYS 2 THRU 8



H

BAYS 9 THRU 14

Figure 5. Spar Lower Flange Repair (Sheet 5)



LEGEND

- 1 BEFORE COLD WORKED
HOLE DIAMETER 0.143 ± 0.003
FINAL REAMED
HOLE DIAMETER 0.1645 ± 0.003
- 2 LENGTH DETERMINED
ON INSTALLATION.
- 3 HEAT TREAT TO T73
CONDITION.
- 4 h IS HEIGHT OF
BAY LESS FLANGES.
- 5 w IS WIDTH OF BAY.

BAY 3

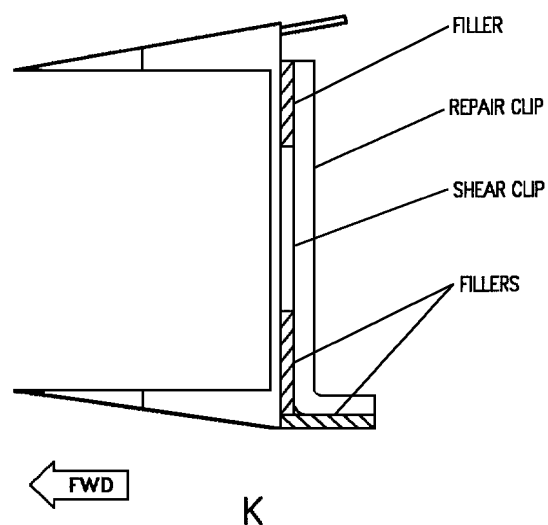


Figure 5. Spar Lower Flange Repair (Sheet 6)

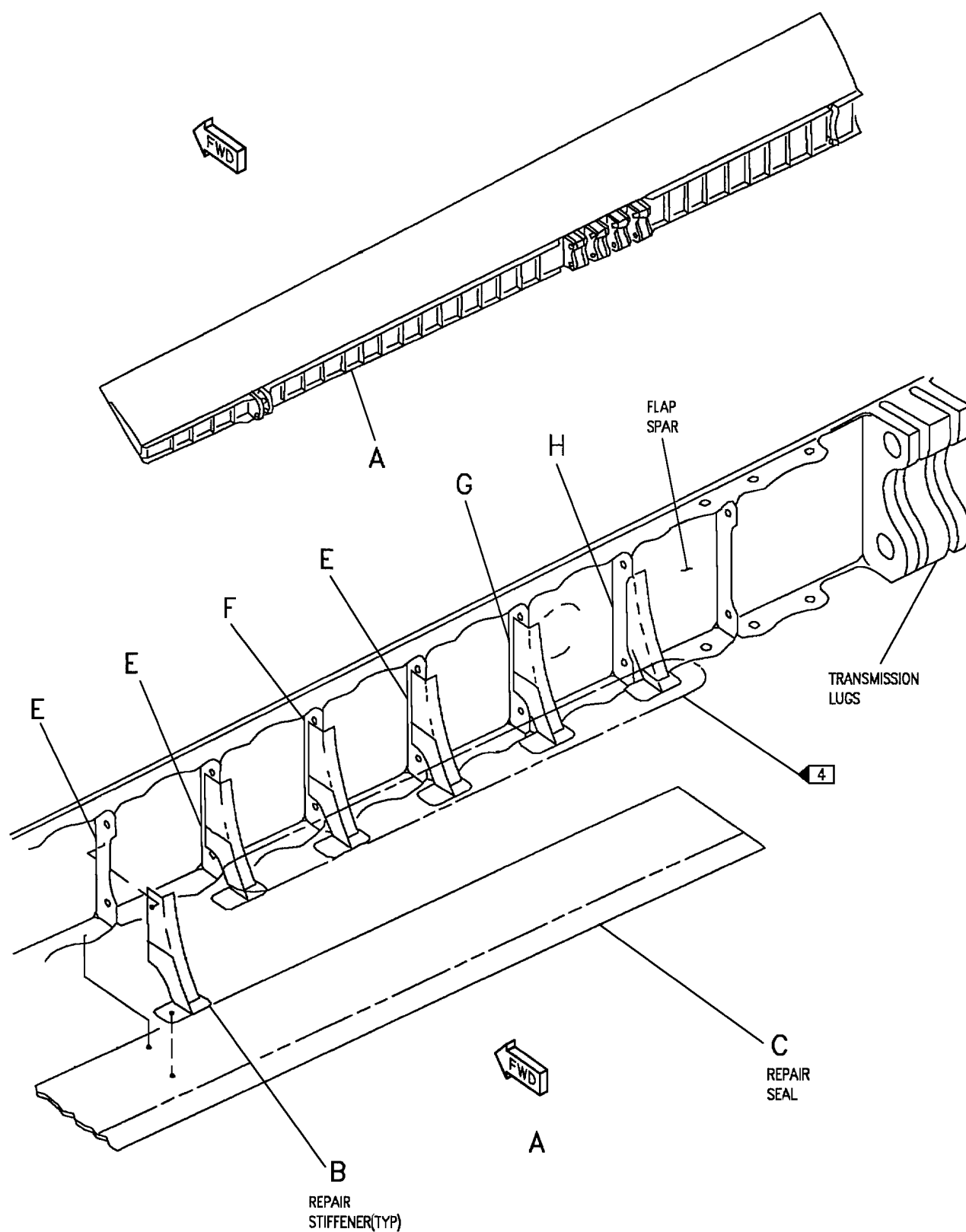


Figure 6. Seal, 74A190617, Repair (Sheet 1)

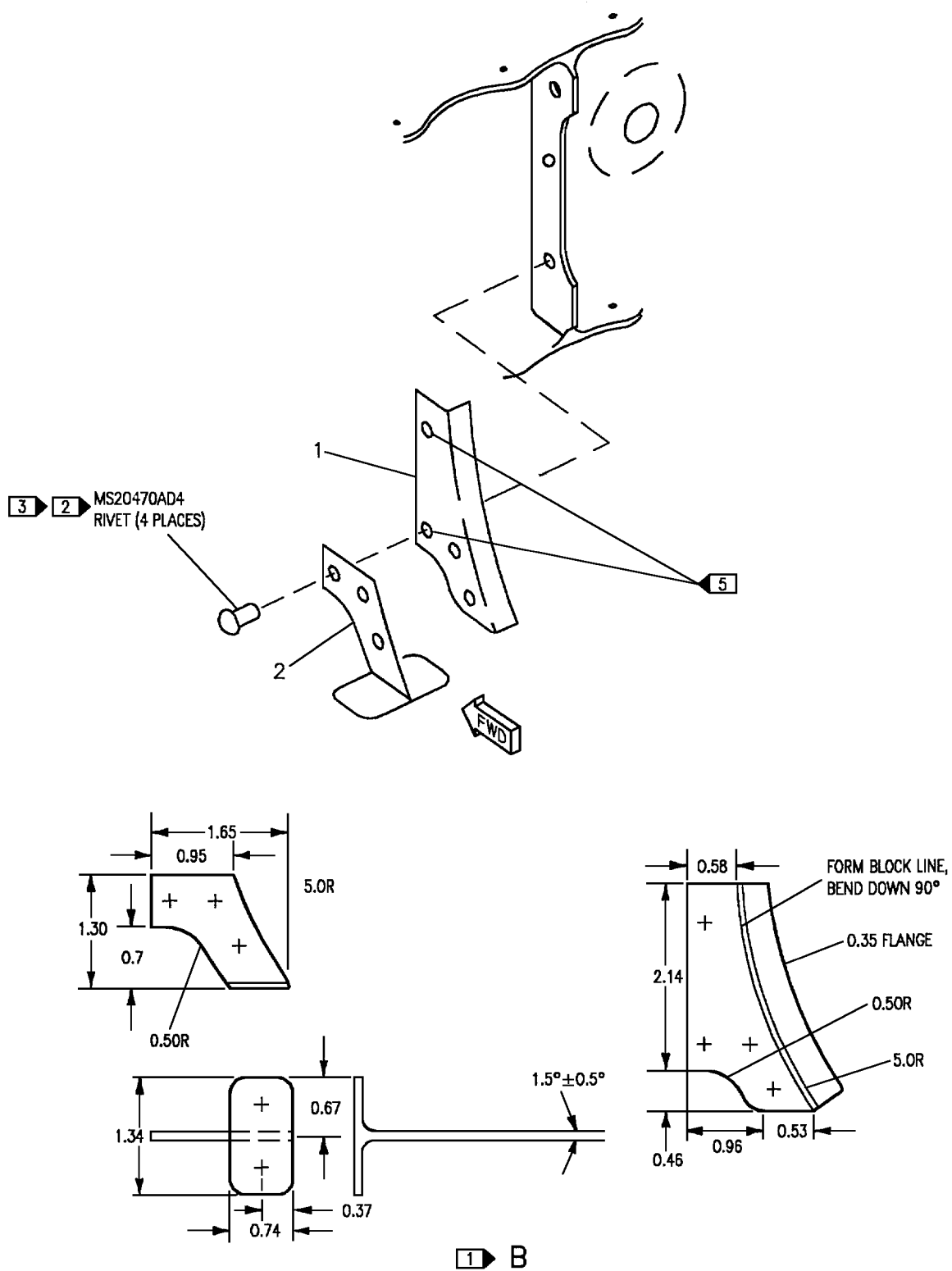


Figure 6. Seal, 74A190617, Repair (Sheet 2)

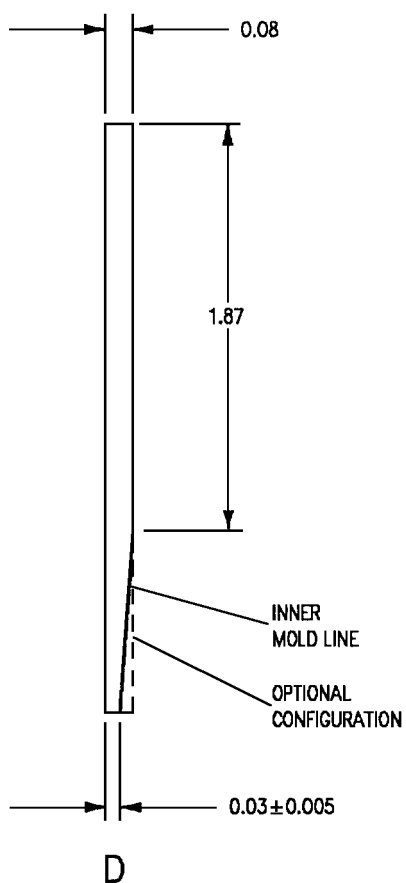
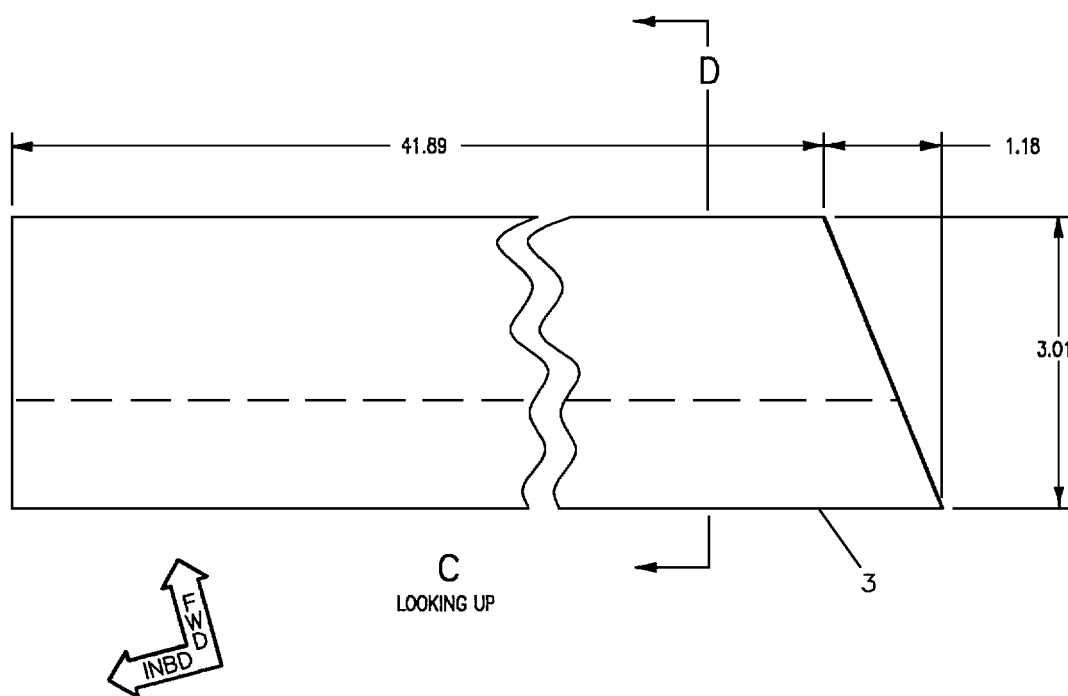
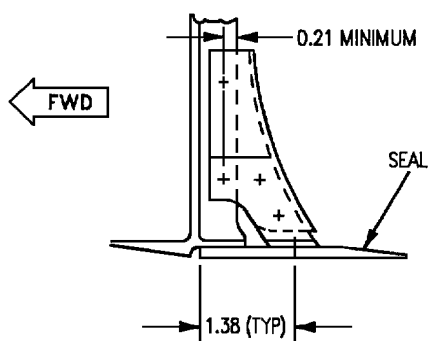
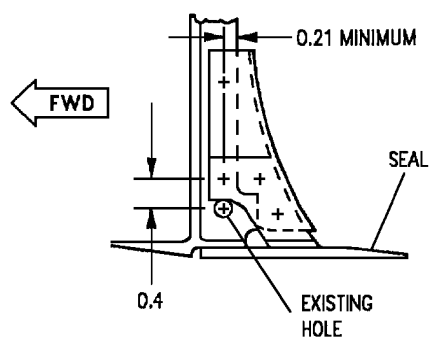


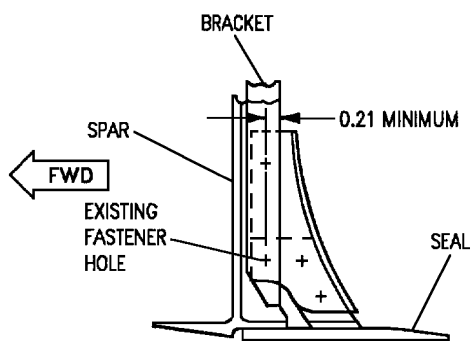
Figure 6. Seal, 74A190617, Repair (Sheet 3)



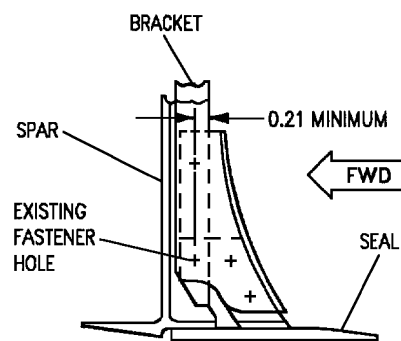
E
LOOKING INBOARD



F
LOOKING INBOARD



H
LOOKING INBOARD



G
LOOKING INBOARD

Figure 6. Seal, 74A190617, Repair (Sheet 4)

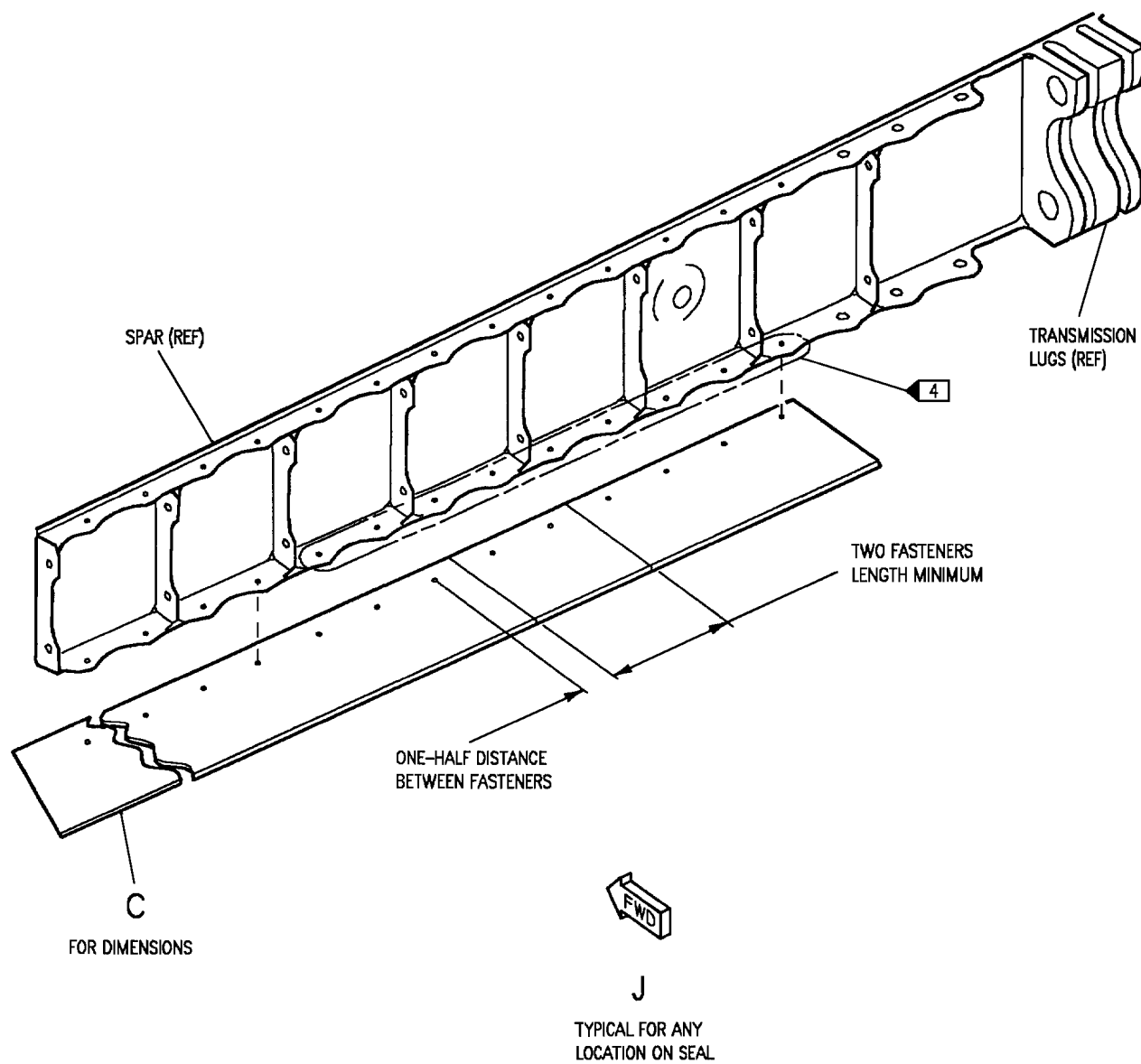


Figure 6. Seal, 74A190617, Repair (Sheet 5)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
1		Bracket	0.063 Sheet	7075-T76 Alclad
2		Tee	Make from 1MA160D03-10277 Extrusion	7075-T6511 Al Aly
3		Seal	0.080 Sheet	7075-T6 Alclad
LEGEND				
1 Typical installation for views E, F, and G. View H installed from inboard side of vertical stiffener.				
2 Length determined on installation.				
3 Hole diameter is 0.125 +0.003 -0.001.				
4 If any of these holes are drilled oversize by more than 0.0156, the holes must be cold worked.				
5 Use NAS1398C4A3, Blind Rivet at these holes for views G and H when standard rivet cannot be installed.				

Figure 6. Seal, 74A190617, Repair (Sheet 6)

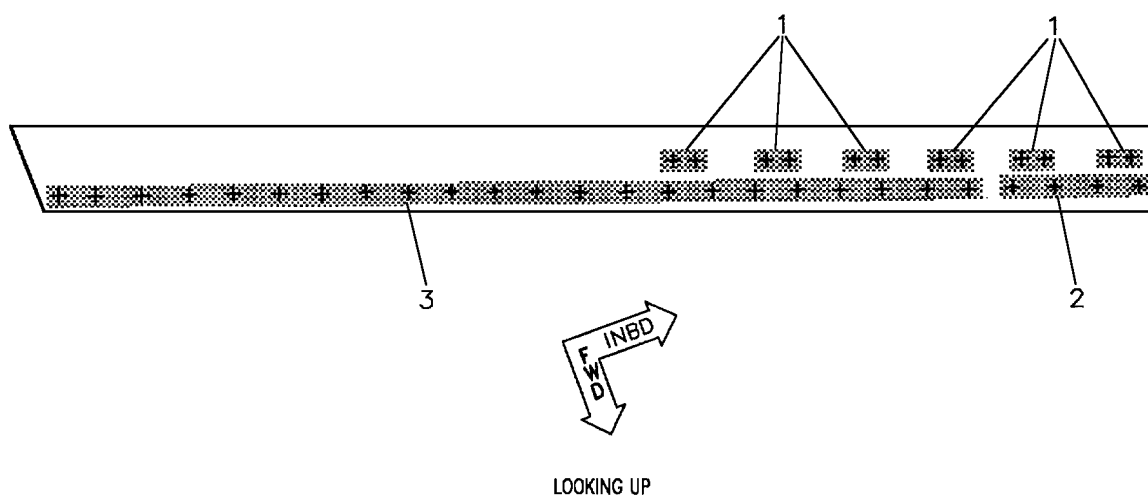


Figure 7. Seal, 74A190617, Fasteners (Sheet 1)












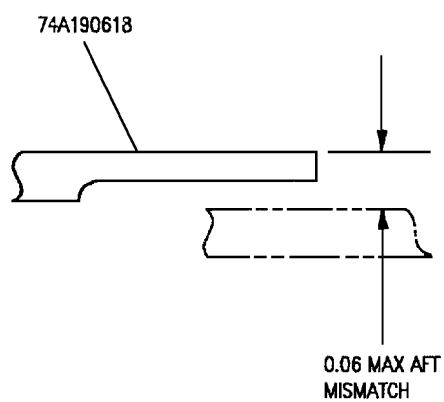
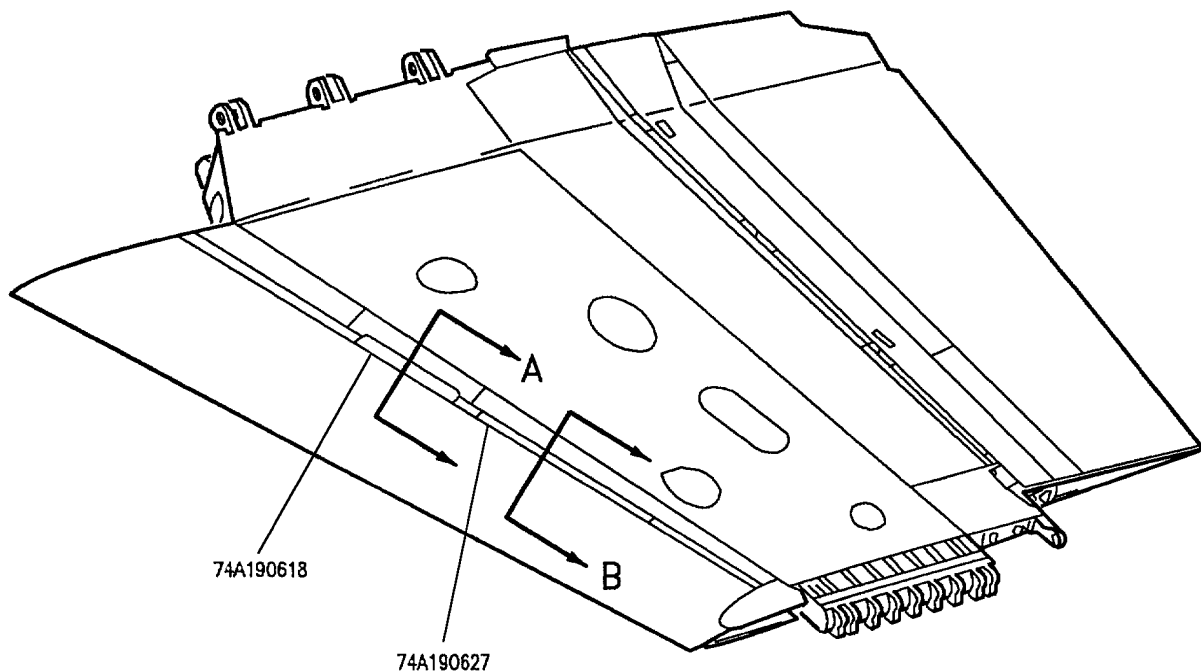
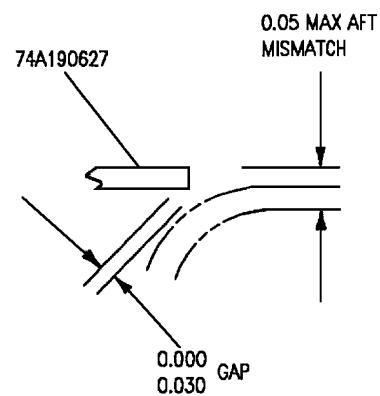
Idx No.	Eft		Nomenclature	Part Number
1		 	Rivet	NAS1097U4
2		 	Rivet	BRFS6T8
3		 	Rivet	BRFS5T7
<p style="text-align: center;">LEGEND</p> <p> Length determined on installation.</p> <p> Hole diameter is 0.125 +0.002 -0.001.</p> <p> Hole diameter is 0.187 +0.002 -0.001.</p> <p> Hole diameter is 0.156 +0.002 -0.001.</p> <p> Alternate replacement fasteners are: PLT1058 Blind Rivet, or HLT311 Pin and HL570 Collar.</p>				

Figure 7. Seal, 74A190617, Fasteners (Sheet 2)



A



B

Figure 8. Seal (74A190616, 74A190617, 74A190618, 74A190623 and 74A190627)
Gap and Mismatch (Sheet 1)

01600801

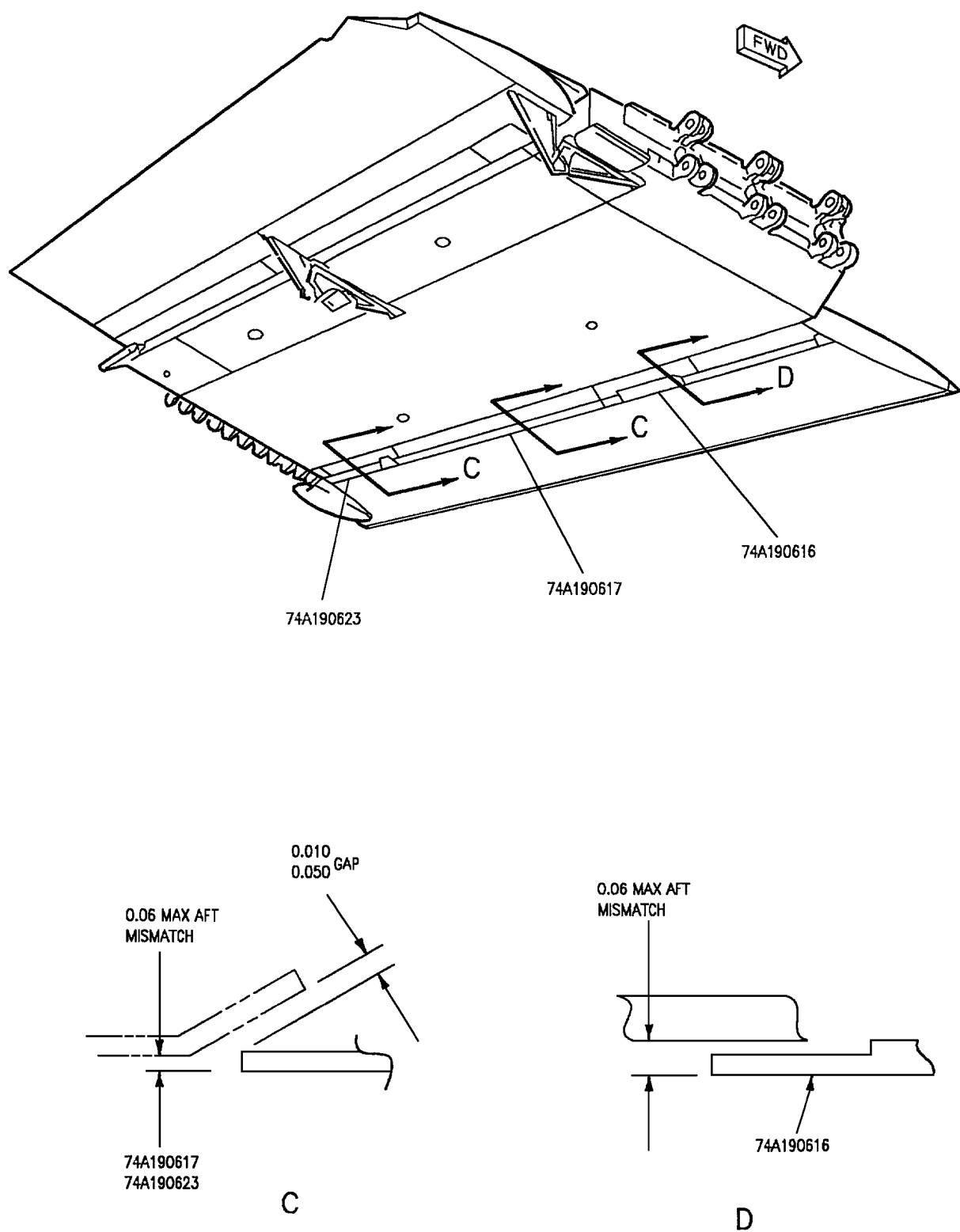


Figure 8. Seal (74A190616, 74A190617, 74A190618, 74A190623 and 74A190627)
Gap and Mismatch (Sheet 2)

01600802

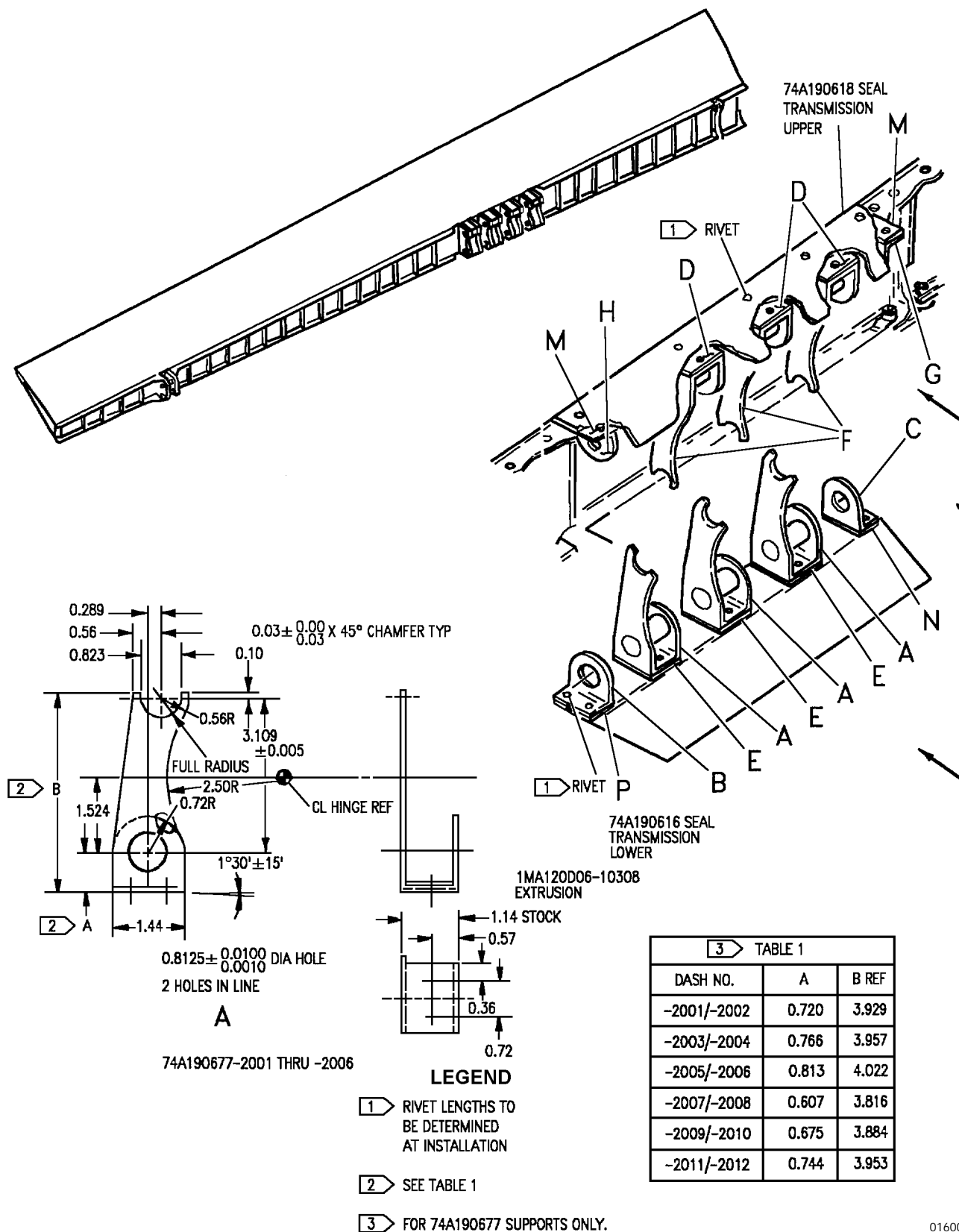
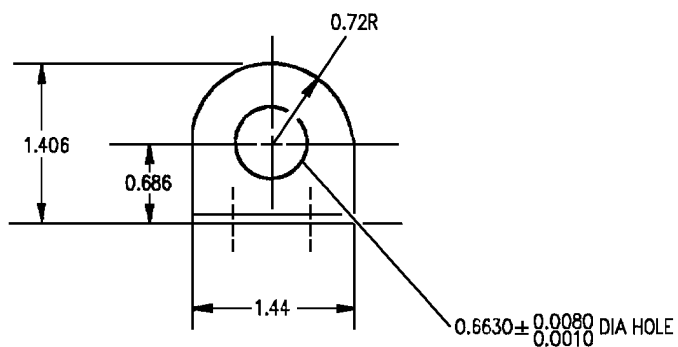
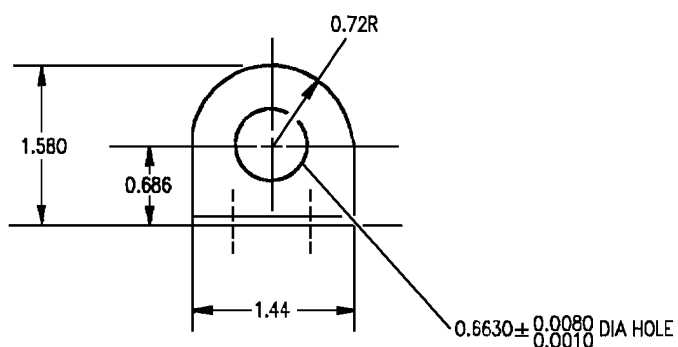
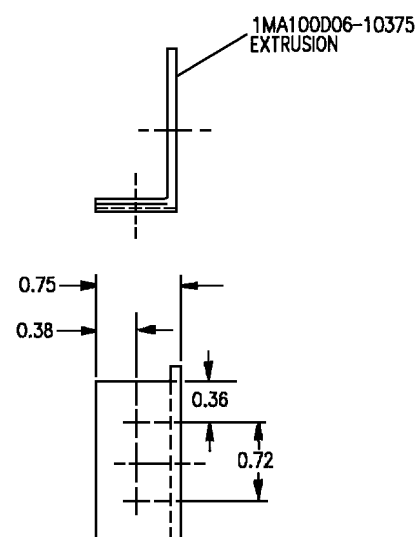


Figure 9. Transmission Seal Assembly, 74A190678, Replacement (Sheet 1)



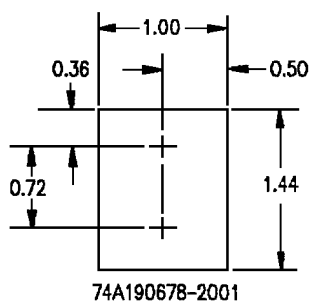
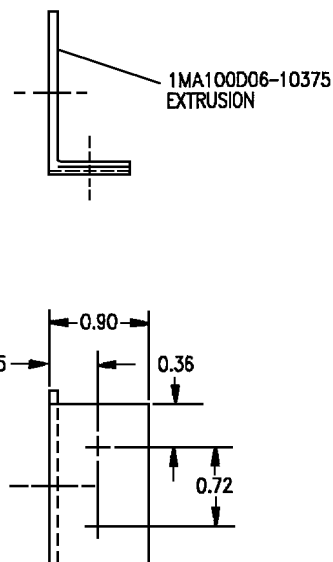
74A190677-2017,-2018

B



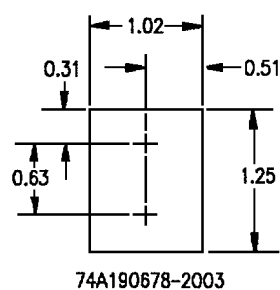
74A190677-2013,-2014

C



74A190678-2001

E



74A190678-2003

D

01600902

Figure 9. Transmission Seal Assembly, 74A190678, Replacement (Sheet 2)

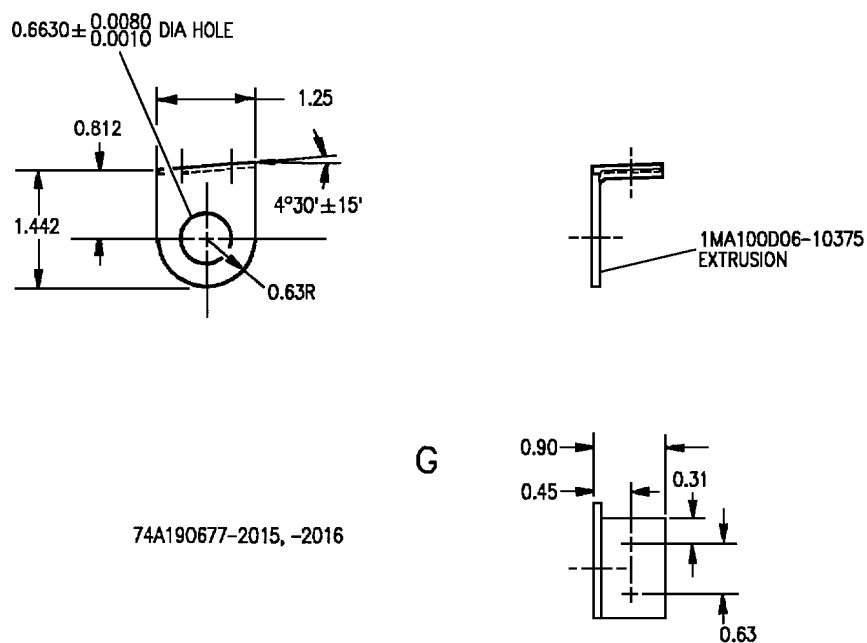
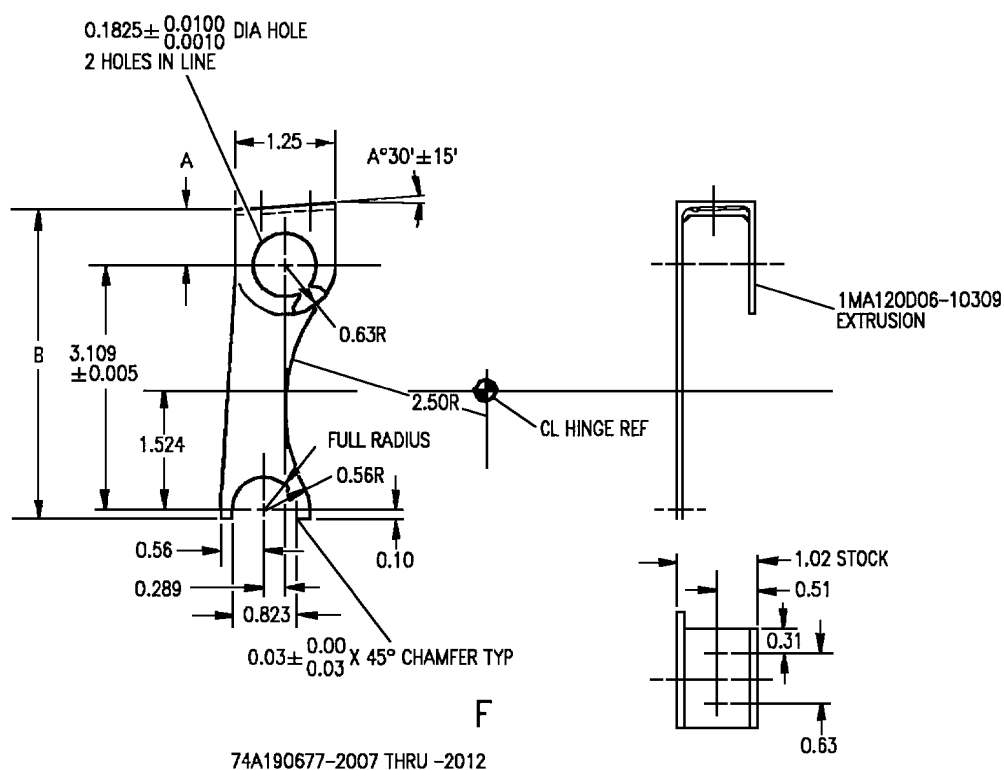
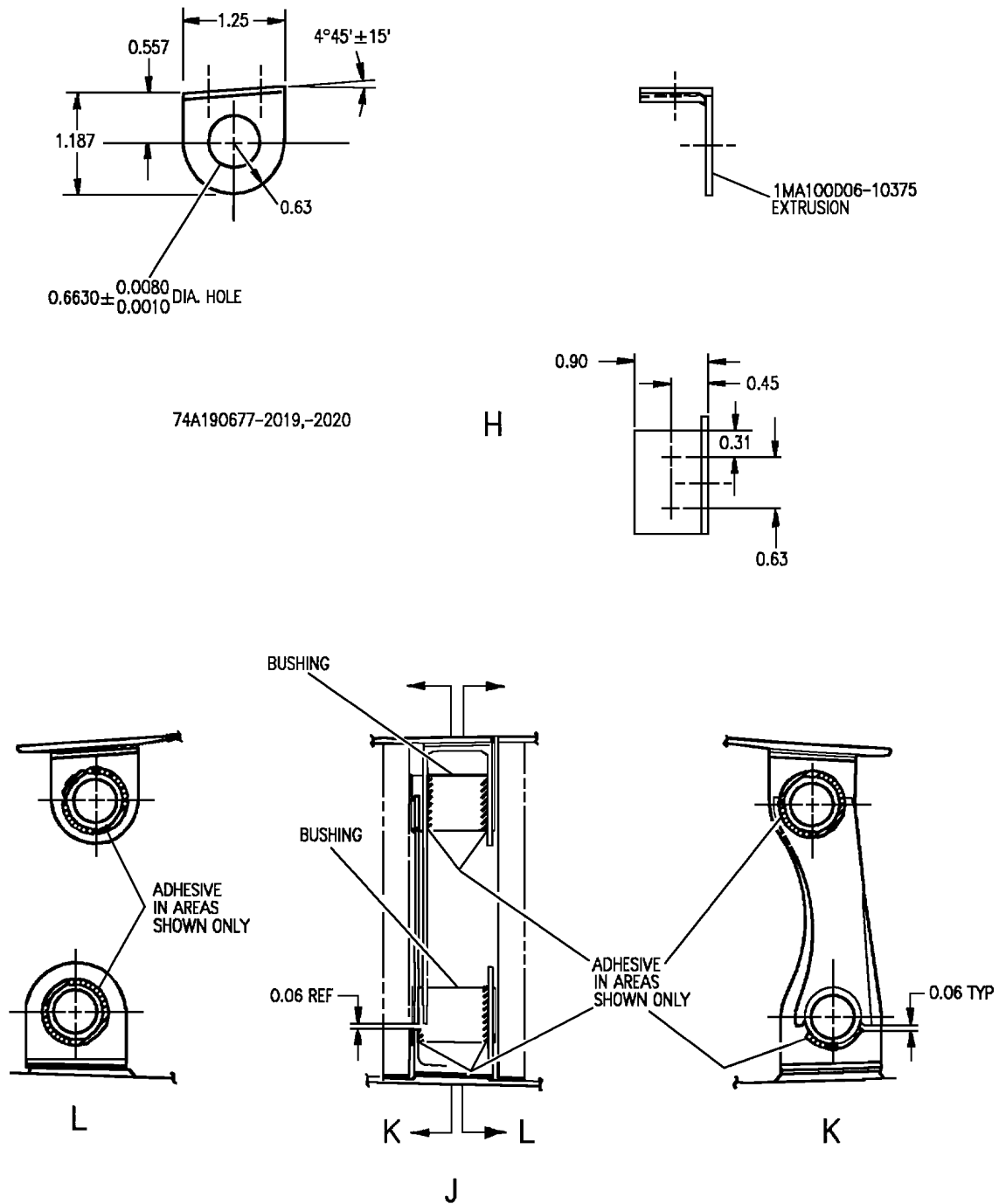


Figure 9. Transmission Seal Assembly, 74A190678, Replacement (Sheet 3)



01600904

Figure 9. Transmission Seal Assembly, 74A190678, Replacement (Sheet 4)

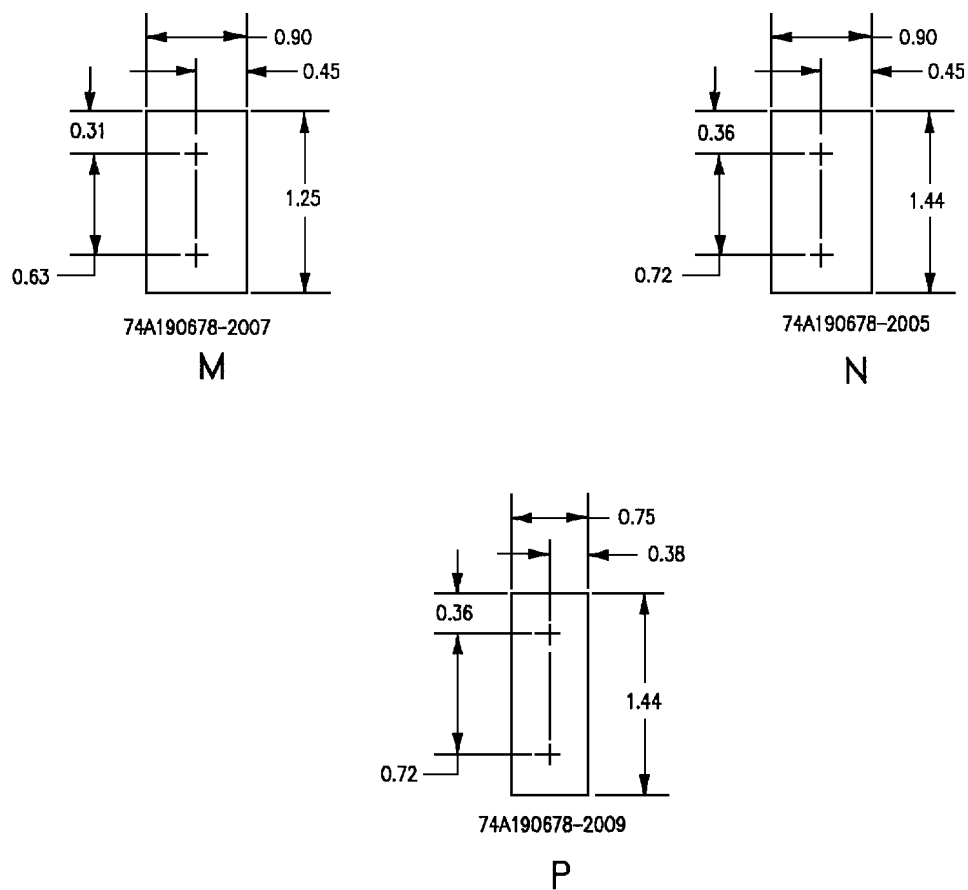


Figure 9. Transmission Seal Assembly, 74A190678, Replacement (Sheet 5)

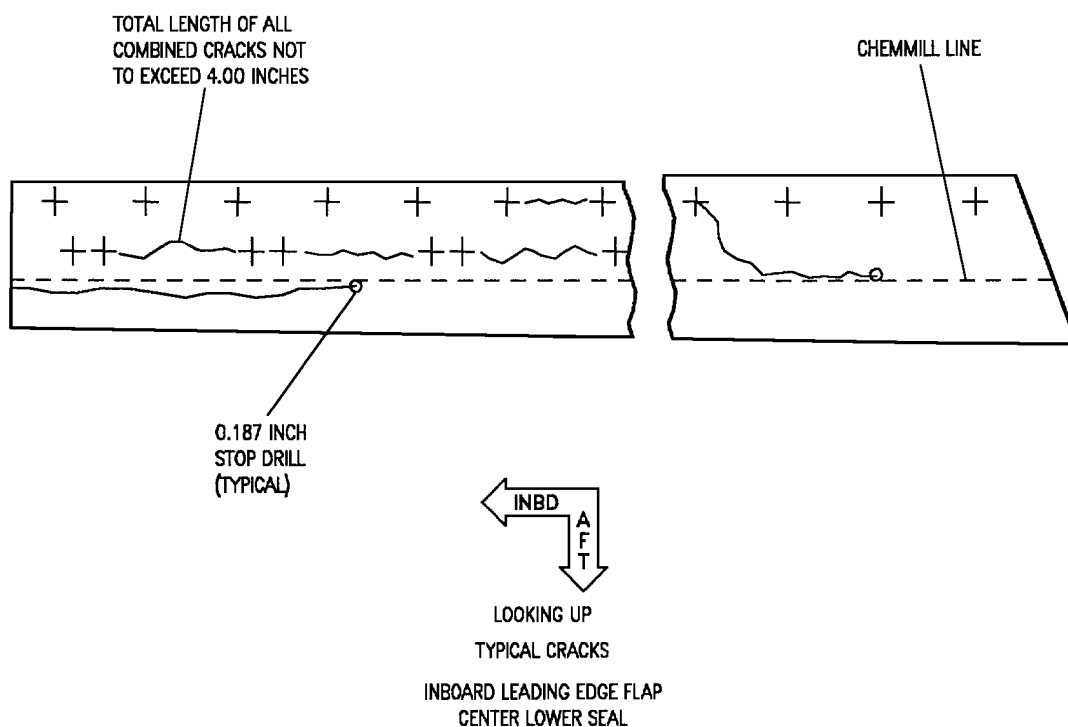
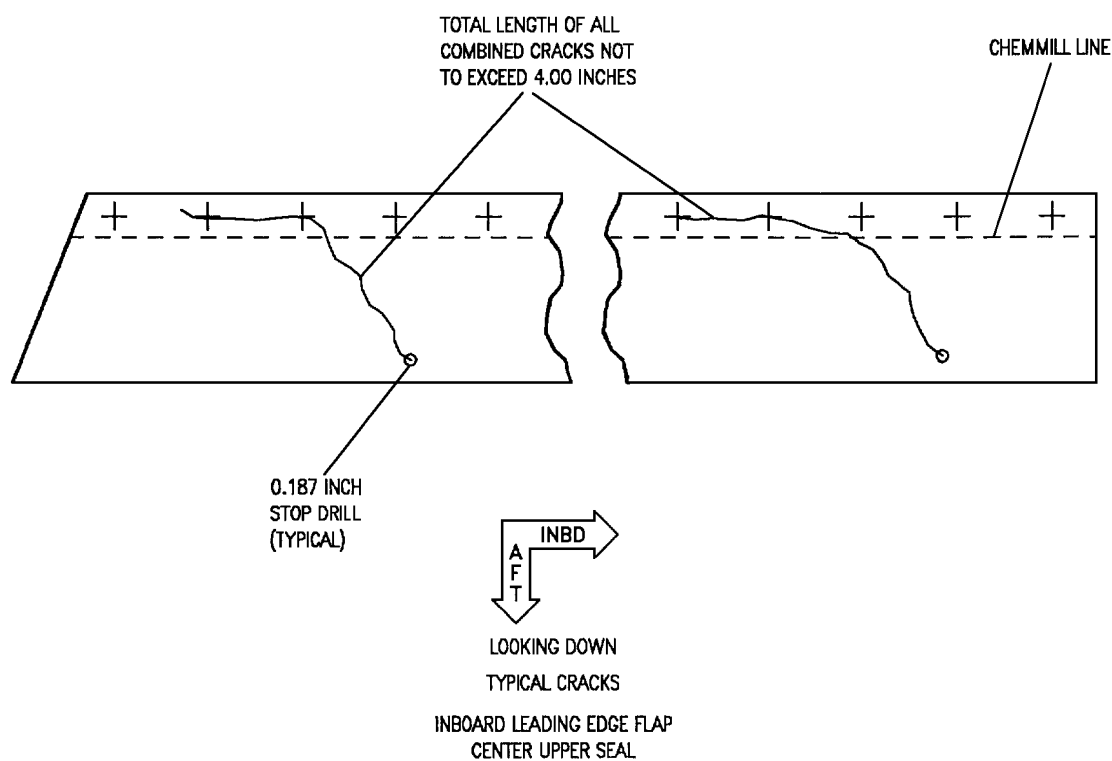
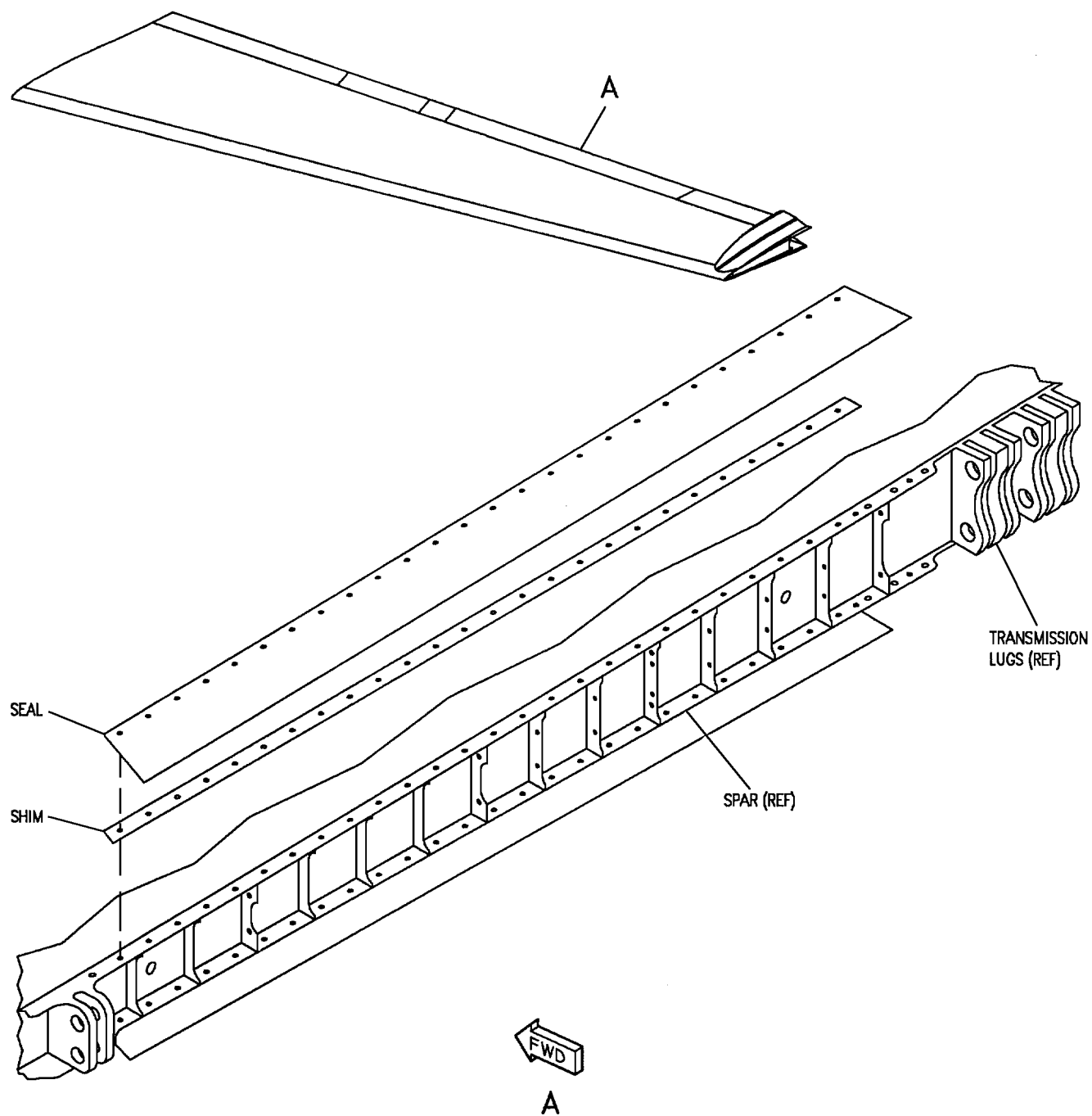


Figure 10. Seals, 74A190617 and 74A190627, Crack Repair



TYPE	FASTENER	HOLE SIZE	COUNTERSINK
NOMINAL	PLT1058-5-4 (CAGE 98524)	0.1645 - 0.1675	0.251 - 0.261
FIRST OVERSIZE	PLT1064-5-4 (CAGE 92215)	0.1800 - 0.1830	0.251 - 0.261

Figure 11. Seal, 74A190627, Replacement

ORGANIZATIONAL, INTERMEDIATE, AND DEPOT MAINTENANCE

STRUCTURE REPAIR

INBOARD LEADING EDGE FLAP,

PART NO. 74A190003

EFFECTIVITY: 161520 AND UP

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Fairing - Wing Fold, Effectivity: 161520 AND UP	WP016 02
Aircraft Corrosion Control	A1-F18AC-SRM-500
Cleaning	WP006 00
Chemical Treatment	WP008 00
Inner and Outer Wing Finish System and Markings	WP027 00
Integrated Flight Controls	A1-F18AC-570-300
Inboard Flap (84MPU535 or 84MPV536)	WP028 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Nondestructive Inspection	A1-F18AC-SRM-300
Penetrant Method	WP004 00
Magnetic Particle Method	WP006 00
Inboard Flap, Water in Honeycomb	WP017 00
Structure Repair, General Information	A1-F18AC-SRM-200
Introduction	WP002 00
Gang Channel and Plate Nut Identification and Repair	WP004 05
Fasteners	WP004 06
Cold Working Fastener Holes	WP004 10
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Structure Repair, Typical Repair	A1-F18AC-SRM-250
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class X Damage Repair	WP005 00
Water Removal	WP005 00
Aluminum Patch Fabrication	WP006 01
Aluminum, Graphite Epoxy, or Titanium Patch Installation and Removal	WP007 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class I Damage Repair	WP022 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class II Damage Repair	WP023 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class III Damage Repair	WP024 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class IV Damage Repair	WP025 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class V Damage Repair	WP026 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class VI Damage Repair	WP027 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class VII Damage Repair	WP028 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class VIII Damage Repair	WP029 00
Aluminum or Titanium Skin and Aluminum Honeycomb Core, Class IX Damage Repair	WP030 00
Aluminum Sheet, Free of Structure and Land Areas	WP031 00
Aluminum and Titanium Sheet, Formed Structure	WP033 00
Aluminum Sheet Edge Repairs	WP034 00
Aluminum Sheet Repairs Across Structure and Lands	WP036 00
Blending	WP038 00
Aircraft Weapons System Cleaning and Corrosion Control	NAVAIR 01-1A-509
Structural Hardware	NAVAIR 01-1A-8

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Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 159	-	Inboard Leading Edge Flap (ILEF) Seal Modification (RAMEC L-47-89)	1 Aug 92	-

1. ALUMINUM SKIN AND HONEYCOMB CORE. See figures 1 and 2.**2. DAMAGE EVALUATION.** See figures 1, 2, and

3. Damage is classified as negligible and repairable. Locating and determining size of damage by visual method is organizational maintenance. Locating and determining size of damage by NDI method is intermediate maintenance. Damage not listed or exceeding the limits below requires a depot engineering disposition.

3. Negligible Damage. See figures 1 and 2. Negligible damage is damage which does not exceed the type and limits below and may be allowed to exist as is.

a. Smooth dents free of sharp corners and abrasions.

(1) Depth is no more than 0.015 inch.

(2) Diameter is not more than 0.5 inch.

(3) No more than three dents occurring in any 3 inch diameter circle.

(4) No more than six dents occurring in any 10 inch diameter circle.

(5) Dents occurring in a line and spaced closer than 1-1/2 dent diameter and does not exceed 3 inches in length.

b. Voids and separations in the adhesive along the length of the bend radius of structural part and of edge member to core to which the core is bonded.

(1) The width is not wider than the bend radius.

(2) Voids and separations do not exceed 2 square inches in any 10 square inches.

(3) Voids and separations do not exceed more than 5 percent of the total bonded area.

4. Repairable Damage. See figures 1 and 3. Repairable damage is damage that can be permanently repaired with no adverse affect on structural integrity, flight characteristics, or safety of aircraft.

5. Void or Unbonds Between Skin and Core, Class I Damage. See figure 3, section A. Class I damage is damage which does not exceed limits below:

a. Diameter is 4 inches or less.

b. Area of damage does not exceed four percent of bonded area.

6. Dents Without Honeycomb Core Damage, Class II Damage. See figure 3, section B. Class II damage is damage which does not exceed limits below:

a. Diameter is 0.50 to 1.5 inches.

b. Depth is 0.015 to 0.050 inches.

c. No crushed core or unbond.

7. Dents With Honeycomb Core Damage, Class III Damage. See figure 3, section C. Class III damage is damage which does not exceed limits below:

a. Diameter is 0.50 to 1.5 inches.

b. Depth is 0.015 to 0.050 inch.

c. May have crushed core or unbonds.

8. Damage Less Than 1.5 Inches Length or Diameter to One Skin, Class IV Damage. See figure 3, Section D. Class IV damage is damage which does not exceed limits below:

a. Damage is one skin only.

b. Length or diameter does not exceed 1.5 inches.

c. Core may or may not be damaged.

9. Damage More Than 1.5 Inches Length or Diameter, up to 4 Inches Maximum to One Skin, Class V Damage. See figure 3, section E. Class V damage is damage which does not exceed limits below:

a. Damage to one skin only.

b. Length or diameter is 1.5 to 4.0 inches.

c. Core damage of any level.

10. Damage Less Than 1.5 Inches Length or Diameter, to Both Skins, Class VI Damage. See figure 3, section F. Class VI damage is damage which does not exceed limits below:

a. Damage may be to both skins.

b. Length or diameter does not exceed 1.5 inches in length.

c. Core damage of any level.

11. Damage More Than 1.5 Inches Length or Diameter, up to 4.0 Inches Maximum to Both Skins, Class VII Damage. Class VII damage includes cracks, bulges, punctures, and sharp dents. See figure 3, section G. Class VII damage is damage which does not exceed limits below:

a. Damage is to both skins.

b. Crack is 1.5 to 4.0 inches in length.

c. Bulges, punctures, and dents can be enclosed in a circle not smaller than a 1.5 inch diameter, and not larger than a 4 inch diameter.

d. Core damage of any kind exists.

12. Structure to Skin or Honeycomb Core, Void or Unbond, Class VIII Damage. See figure 3, section H. Class VIII damage is damage which does not exceed limits below:

a. Between skin and edge member, not extending into core.

b. Damage may or may not be open to the edge.

c. Voids between edge member and core.

13. Honeycomb Core Splice, Void or Unbond, Class IX Damage. See figure 3, section J. Class IX damage is damage that occurs at the honeycomb core splice line.

a. Voids and separation in the honeycomb splice joints.

b. Unbonds of core splice.

14. Water in Honeycomb Core, Class X Damage. Damage is water trapped in honeycomb core. To inspect for water in honeycomb core, do NDI (A1-F18AC-SRM-300, WP017 00).

15. **REPAIRS.** Blend scratches, nicks, gouges, or corrosion (A1-F18AC-SRM-250, WP038 00). If, after

blending, the damage limits of table 2 are exceeded, repair damage per Class IV or Class V damage. Classes I, II, III, IV, VI, VIII, IX, X are organizational maintenance. Classes V and VII are intermediate maintenance. Repair damages by the procedures referenced below:

a. Repair Class I damage and install patch (A1-F18AC-SRM-250, WP022 00).

b. Repair Class II damage (A1-F18AC-SRM-250, WP023 00).

c. Repair Class III damage and install patch (A1-F18AC-SRM-250, WP024 00).

d. Repair Class IV damage and install patch (A1-F18AC-SRM-250, WP025 00).

e. Repair Class V damage and install patch (A1-F18AC-SRM-250, WP026 00).

f. Repair Class VI damage and install patch (A1-F18AC-SRM-250, WP027 00).

g. Repair Class VII damage and install patch (A1-F18AC-SRM-250, WP028 00).

h. Repair Class VIII damage (A1-F18AC-SRM-250, WP029 00).

i. Repair Class IX damage and install patch (A1-F18AC-SRM-250, WP030 00).

j. Repair Class X damage (A1-F18AC-SRM-250, WP005 00).

16. FAIRING, WING FOLD.

17. For repairs and replacement (WP016 03).

18. METAL SKINS AND STRUCTURE.

19. **DAMAGE EVALUATION.** See figures 1 and 4. Damage is classified as negligible and repairable. The types of materials used are shown on figure 1. Repair zones are shown on figure 4. Allowable damage limits within repair zones are listed in tables 1 and 2. Locating and determining size of damage by visual method is organizational maintenance. Damage not listed or exceeding the limits below requires a depot engineering disposition.

20. **Negligible Damage.** Negligible damage is damage that may be allowed to exist as is. However, preventive maintenance, for temporary corrosion arrestment, should be done to scratches (NAVAIR 01-1A-509). The types and limits of

damage are listed below and in table 1. The figure and index numbers in table 1 coincide with the figure and index numbers in the material index.

a. Scratches are not allowed within one diameter from the edge of any hole.

b. Smooth dents only, effective diameter at least 20 times the depth.

21. Repairable Damage. The types and limits of damage are listed below and in table 2. The figure and index numbers in table 2 coincide with figure and index numbers in the material index, figure 1.

NOTE

The limits in table 2 apply after blending the damage.

a. Scratches.

(1) Any scratches within one diameter of any hole must be blended out. Minimum blend out is one diameter from edge of any hole.

(2) Scratches to be blended out with diameter, or width, at surface at least 20 times the depth.

b. Nicks, gouges, and corrosion to be blended out with diameter, or width, at surface at least 20 times the depth.

c. Cracks. All cracks must be repaired.

d. Holes.

(1) Damage in areas free of structure and lands must have edge cleanup hole at least eight repair fasteners diameters from any land, internal structure, or existing row of fasteners.

(2) Damage to lands, over structure, only one repair per land.

e. Dents exceeding the limits in Table 1 must be repaired.

22. REPAIRS. Types of repairs are temporary, one-time flight, permanent, critical area, alternate, and typical. Repair type definitions are in structure repair terms (A1-F18AC-SRM-200, WP002 00).

23. Permanent Repairs.

24. Scratches, Nicks, Gouges, or Corrosion. Blend nicks, gouges, or corrosion (A1-F18AC-SRM-250, WP038 00). If, after blending, the damage limits of table 2 are exceeded, repair aluminum sheet. Refinish blended areas on moldline skin (A1-F18AC-SRM-500, WP027 00).

a. Scratches - make crack or edge repair.

b. Nicks, gouges, or corrosion - make hole or edge repair.

25. Cracks.

a. In repair zones A1, A2, and A3, repair cracks free of structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP031 00).

(1) Stop drill ends of cracks in repair zones A1 and A2. Rout out crack in repair zone A3.

(2) Install lap patch.

(3) Refinish repaired area on moldline skin (A1-F18AC-SRM-500, WP027 00).

b. In repair zone B3, repair cracks free of structure or land areas in aluminum sheet (0.050 thickness or less).

(1) Cut out damage in the smallest diameter circle.

(2) Fabricate patch (A1-F18AC-SRM-250, WP006 01).

(3) Install patch using FM300 adhesive (A1-F18AC-SRM-250, WP007 00).

(4) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

c. In repair zones A1, A2, and A3, repair cracks across structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP036 00).

(1) Cut out damage.

(2) In repair zones A1, A2, or A3, make repairs.

(a) Damage to Bay Requiring Repair Across Land; install flush or lap patch.

(b) Damage to Bay Requiring Repair Across Land and Edge of Part; install flush or lap patch.

(c) Damage to Land or Land or Bay; install flush or lap patch.

(3) Refinish repaired area on moldline skin (A1-F18AC-SRM-500, WP027 00).

d. In repair zones A1, A2, and A3, repair cracks to aluminum formed structure (A1-F18AC-SRM-250, WP033 00).

(1) Cut out damage.

(2) In repair zones A1, A2, or A3, install repair one through six. Select the repair that can be adapted to the patch.

(3) Refinish repaired area on moldline skin (A1-F18AC-SRM-500, WP027 00).

26. Holes.

a. In repair zones A1, A2, and A3, repair holes free of structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP031 00).

(1) Cut out damage.

(2) Install type one flush or lap patch.

(3) Refinish repaired area on moldline skin (A1-F18AC-SRM-500, WP027 00).

b. In repair zone B3, repair holes free of structure or land areas in aluminum sheet (0.050 thickness or less).

(1) Cut out damage in the smallest diameter circle.

(2) Fabricate patch (A1-F18AC-SRM-250, WP006 01).

(3) Install patch using FM300 adhesive (A1-F18AC-SRM-250, WP007 00).

(4) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

c. In repair zones A1, A2, and A3, repair holes across structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP036 00).

(1) Cut out damage.

(2) In repair zones A1, A2, or A3, make repairs.

(a) Damage to Bay Requiring Repair Across Land; install flush or lap patch.

(b) Damage to Bay Requiring Repair Across Land and Edge of Part; install flush or lap patch.

(c) Damage to Land or Land or Bay; install flush or lap patch.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

d. In repair zones A1, A2, and A3, repair holes to aluminum formed structure (A1-F18AC-SRM-250, WP033 00).

(1) Cut out damage.

(2) In repair zones A1, A2, or A3, install repair one through six. Select the repair that can be adapted to the patch.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

27. Edge. In repair zones A1, A2, and A3, repair edge damage in aluminum sheet (A1-F18AC-SRM-250, WP034 00).

a. Cut out damage.

b. Select repair patch (A1-F18AC-SRM-250, WP034 00).

(1) Corner Damage to Lands.

(2) Corner Damage to Lands and Bays.

(3) Edge Damage to Land.

(4) Edge Damage to Lands and Bays.

(5) Full Width Damage to End.

c. Refinish repaired area on moldline skin (A1-F18AC-SRM-500, WP027 00).

28. Dents.

a. In repair zones A1, A2 and A3, repair dents free of structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP031 00).

(1) Cut out damage.

(2) Install type one flush or lap patch.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

b. In repair zone B3, repair dents free of structure or land area in aluminum sheet (0.050 thickness or less).

(1) Cut out damage in the smallest diameter circle.

(2) Fabricate patch (A1-F18AC-SRM-250, WP006 01).

(3) Install patch using FM300 Adhesive (A1-F18AC-SRM-250, WP007 00).

(4) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

c. In repair zones A1, A2, and A3, repair dents across structure or land areas in aluminum sheet (A1-F18AC-SRM-250, WP036 00).

(1) Cut out damage.

(2) Make repairs given below.

(a) Damage to Bay Requiring Repair Across Land; install flush or lap patch.

(b) Damage to Bay Requiring Repair Across Land and Edge of Part; install flush or lap patch.

(c) Damage to Land or Land and Bay; install flush or lap patch.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

d. In repair zones A1, A2, and A3, repair dents to aluminum formed structure (A1-F18AC-SRM-250, WP033 00).

(1) Cut out damage.

(2) Install repair one through six. Select the repair that can be adapted to the damaged part.

(3) Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

29. **Spar Lower Flange Repair.** This repair is depot level maintenance. For attaching hardware (WP006 01). Repair is only for lower flange between outboard transmission lug and the outboard hinge. Bays are numbered from transmission lugs, outboard. Bays 1 thru 14 are repairable, see figure 6.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
7075-0 Alclad, 0.100 (Repair Clip)	QQ-A-250/12
7075-T6 Alclad, 0.080 (Filler for Spar Flanges) and 0.050 (Filler for Bay 3 Web)	QQ-A-250/12
Adhesive	EA9321A/B
Blind Fastener (as Required)	PLT270-5-()
Cloth, Scrim, Nylon	Pattern 30
Rivet, Solid, Flush, Tension Head	MS20426AD4
Screw (as Required)	HT4024L4-()

a. For bays 1 and 2 remove door 149 (A1-F18AC-LMM-010). For bays 3 thru 14, remove seal 74A190617 by removing rivets.

b. Remove gang channel from spar flange (bay 1), or plate assembly from spar flange (bay 2).

c. Trim damaged flange, views A and B.

d. Do a type I, method C fluorescent penetrant inspection to be sure cracks are removed, (A1-F18AC-SRM-300, WP004 00).

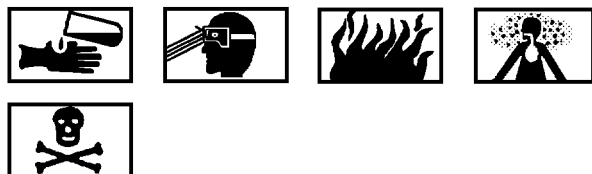
e. For bay 3, remove ST9M387-6 plate and 74A190633 brackets.

f. Locate and drill holes in spar, views C, D, and E.

g. Cold work holes in spar (A1-F18AC-SRM-200, WP004 10).

h. Ream holes to final diameter, views C, D, and E.

i. Fabricate repair clip for bay 1 view F, for bays 2 thru 8 view G, for bays 9 thru 14 view H.



Adhesive

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j. Attach repair clip to spar using blind fasteners. Install fasteners wet with EA9321 A/B Adhesive (A1-F18AC-SRM-200, WP011 00), views C, D, and E.

k. Fabricate filler to fit in spar flange cut out area, and match drill fastener holes.

l. Prepare EA9321 A/B adhesive and bond filler to repair clip, with scrim cloth between filler and clip, using adhesive (A1-F18AC-SRM-200, WP011 00).

m. For bay 1 bond gang channel, for bay 2 bond plate assembly removed in step b to repair clip with EA9321 A/B adhesive per Bonding Gang Channel with Adhesive (A-F18AC-SRM-200, WP004 05).

n. For bay 1 install rivet through filler, clip, and gang channel, view C; for bays 2 thru 14 install rivet through filler, clip, and plate nuts, views D and E.

o. For bay 3, install plate and brackets removed in step e.

p. Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

q. For bays 1 and 2, determine fastener length and install door 149 (A1-F18AC-LMM-010).

r. For bays 3 thru 14, install seal per Seal, 74A190617, Repair, this work package.

s. Verify gap and mismatch per rework of seals (74A190616, 74A190617, 74A190618, 74A190623, and 74A190627), this work package.

30. Seal, 74A190617, Repair. See figure 7. This repair is only applicable to aircraft before incorporation of F/A-18 AFC 159. Cold working holes is depot level maintenance.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
7075-T6 Alclad, 0.080 (for Seal)	QQ-A-250/25
7075-T6 Alclad, 0.063 (for Bracket)	QQ-A-250/25
Extrusion (for Tee)	1MA160D03-10277

31. Total Replacement.

a. Remove seal by removing rivets (NAVAIR 01-1A-8).

b. Fabricate repair stiffeners, view B, and repair seal, view C.

c. Do chemical treatment to fabricated parts (A1-F18AC-SRM-500, WP008 00).

d. Cold work holes as required, view A (A1-F18AC-SRM-200, WP004 10).

e. Locate, drill, and countersink spar fastener holes in repair seal.

f. Locate repair seal in place on lower flange of spar.

g. Locate and install repair stiffeners on spar with rivets using squeeze method (NAVAIR 01-1A-8). For spar fasteners, view B. For locations of stiffeners on spar, view A.

h. Drill and countersink repair stiffener fastener holes in repair seal.

i. Install fasteners in seal and stiffeners. See figure 8 for fasteners.

j. Inspect for satisfactory clearance between repair stiffeners and wing upper and lower seals per rework of seals (74A190616, 74A190617, 74A190618, 74A190623, and 74A190627), this WP.

k. Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

32. Section Replacement.

NOTE

Any section along total length of seal may be repaired provided a minimum of 2 fasteners are located in the section.

a. Remove damaged section of flap seal by removing rivets (NAVAIR 01-1A-8) and cutting seal on centerline between 2 fasteners, view J.

b. Fabricate section of seal to fill area of removed seal.

c. Do chemical treatment to section of seal (A1-F18AC-SRM-500, WP008 00).

d. Cold work holes as required, view J (A1-F18AC-SRM-200, WP004 10).

e. Locate, drill, and countersink fastener holes in seal section.

f. Install seal section. For fasteners, see figure 8.

g. Inspect for satisfactory clearance between repair stiffeners and wing upper and lower seals per rework of seals (74A190616, 74A190617, 74A190618, 74A190623, and 74A190627), this WP.

h. Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

33. Leading Edge Flap Transmission Rod, Cadmium Plating Repair. Cadmium plating shall be replaced if worn, damaged or missing. Replacement of cadmium plating is intermediate level maintenance. For removal and installation, and part information (A1-F18AC-570-300, WP028 00).

Support Equipment Required

None

Materials Required

None

a. Remove worn or damaged plating from rod.

b. Do NDI on unplated rod per Magnetic Particle Method (A1-F18AC-SRM-300, WP006 00).

c. If rod is damaged, get replacement rod and go to step f. If rod is undamaged, continue with next step.

d. Measure diameter of unplated rod.

(1) If diameter is less than 0.6613, get replacement rod and go to step f.

(2) If diameter is equal to, or more than 0.6613, but less than 0.6619, apply cadmium plating to rod.

NOTE

Nominal rod diameter, after cadmium plating is 0.6630, +0.0000, -0.0011.

e. Measure newly plated rod to make sure it is within nominal diameter.

f. Install rod.

34. Temporary Repairs.

35. Seals, 74A190617 and 74A190627, Crack Repair. See figure 5. This temporary repair is done with seals installed on the aircraft and is satisfactory until aircraft is down for other maintenance action. Seals shall be monitored after each flight for more cracks. Combined length of all cracks shall not exceed 4.0 inches.

Support Equipment Required

None

Materials Required

None

a. Inspect seals and determine amount of damage.

(1) If combined length of all cracks is 4.0 inches or less, go to step b.

(2) If combined length of all cracks is more than 4.0 inches, replace seal.



Do not stop drill cracks over existing substructure. Damage to substructure will occur.

b. Stop drill cracks by drilling a 0.187 diameter hole at one or both ends of cracks.

c. Clean area of shavings.

36. **REWORK OF SEALS (74A190616, 74A190617, 74A190618, 74A190623, AND 74A190627).** See figure 8.

a. Trim seal to allowable gap, views A, B, C and D.

b. Refinish trimmed edge (A1-F18AC-SRM-500, WP027 00).

37. **REPLACEMENT.**

38. **Transmission Seal Assembly, 74A190678.** See figure 10. Any or all parts will be locally manufactured and assembled as shown.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA934
Bushing	4M106-10006
Extrusion (for 74A190677-2001 thru -2006)	1MA120D06-10308
Extrusion (for 74A190677-2001 thru -2007)	1MA120D06-10309
Extrusion (for 74A190677-2013, -2014, -2017, -2018)	1MA100D06-10375
Extrusion (for 74A190677-2015, -2016, -2019, -2020)	1MA100D06-10375
Rivets	CSR902B-5

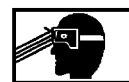
Materials Required (Continued)

Nomenclature	Specification or Part Number
Seal, Transmission, Lower	74A190616
Seal, Transmission, Upper	74A190618
Shim, AL LAM 5052-H39 (for 74A190678-2001, -2003)	MIL-S-22499, Class 2, Type 1

a. Remove inboard flap (A1-F18AC-570-300, WP028 00).

b. Fabricate replacement supports and shims as required per figure 10.

c. Insert bushings into applicable support, view J.



Adhesive

3

d. Bond bushing to support each location as shown view J, using adhesive. Adhesive preparation and application (A1-F18AC-SRM-200, WP011 00).

e. Get replacement seals as required.

f. Assemble replacement parts per steps below:

(1) Locate supports in transmission and insert rod to hold parts in place.

(2) Trim and drill replacement seal using rivet holes in supports (A1-F18AC-SRM-200, WP004 06).

(3) Remove pins and supports. Clean shavings from area.

(4) Attach supports and shims to seal using rivets.

g. Refinish repaired area (A1-F18AC-SRM-500, WP027 00).

h. Install inboard flap (A1-F18AC-570-300, WP028 00).

39. **Outboard Closure Plate and Core Replacement.** See figure 11. This repair is done at intermediate maintenance level.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Honeycomb Core Kit	135001-1001, -1002, -1005, -1007, -1009, or -1011, 1/8-inch cell, 0.002 Inch Thick Foil
or	or
Aluminum Alloy Honeycomb Plug Repair Kit	74K000005
Paper, Abrasive	A-A-1047, Grit 240-9X11
Sealing Compound	MIL-S-83430
Tape, Pressure Sensitive	855-1.000

a. Remove remaining sections of core from closure rib using X-acto knife or equivalent and needle nose pliers.



Be careful when removing core not to damage structure.

b. Vacuum all chips and dust from repair area.

c. Remove all remaining sealing compound with plastic scraper. Sand surfaces of closure rib to uniform finish using abrasive paper.

d. Clean area per Solvent Cleaning (A1-F18AC-SRM-500, WP006 00).

e. Trim a section of core material to fit closure rib so that core ribbon direction is parallel to wing reference plane.

f. Get replacement closure plate, then clean surface to be bonded per Solvent Cleaning (A1-F18AC-SRM-500, WP006 00).



Sealing Compound



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h. Apply sealing compound to outer surface of core, then to inner surface of closure plate, and tape in place (A1-F18AC-SRM-200, WP011 00).

i. Cure sealing compound (A1-F18AC-SRM-200, WP011 00).

j. Apply Chemical Conversion Surface Treatment ((A1-F18AC-SRM-500, WP008 00).

k. Refinish repair area as required. (A1-F18AC-SRM-500, WP027 00).

40. Seal, 74A190627, Replacement. See figure 12.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Blind Rivet	PLT1058-5-4
(CAGE 98524)	
Blind Rivet	PLT1064-5-4
(CAGE 92215)	
Isopropyl Alcohol	TT-I-735, Grade 1
Rymple Cloth	AMS-3819

a. Remove inboard leading edge flap (A1-F18AC-570-300, WP028 00).



Be careful when drilling out rivets not to elongate or oversize holes.

b. Remove existing/damaged seal and shim from structure by drilling out rivets (NAVAIR 01-1A-8, Section I, Rivets).



Isopropyl Alcohol



4

g. Apply sealing compound to mating surfaces of closure rib and core, then insert core into closure rib, (A1-F18AC-SRM-200, WP011 00).

c. Clean spar flange, where seal mated with the leading edge flap, using clean rymple cloth moistened with isopropyl alcohol.

d. Clean up fastener holes. See figure for hole diameters of nominal or first oversize rivets.

e. Get replacement seal and shim. For parts information (A1-F18AC-SRM-410, FIG 012 00).

f. Position replacement shim and seal in place on flap spar and locate fastener holes. For locating blind holes (A1-F18AC-SRM-200, WP004 03).

g. Drill holes in replacement seal and shim to applicable nominal/first oversize diameter. See figure for hole sizes.

h. Countersink holes in seal. See figure for countersink dimensions.

i. Clean and deburr seal and shim. Clean area of any shavings.

j. Attach seal and shim to spar flange using applicable size fastener. See figure for nominal/first oversize fastener part number.

k. Refinish repair area (A1-F18AC-SRM-500, WP027 00).

l. Install inboard leading edge flap (A1-F18AC-570-300, WP028 00).

NOTE

Make sure correct fit and gap exists between replacement seal and leading edge of wing to avoid damage during operation.

m. Do Rework of Seals (74A190617, 74A190618, 74A190623 and 74A190627) for 74A190627 seal, this WP.

Table 1. Negligible Damage Limits







































Fig No Idx No	Nomen/ Repair Zone	Thickness	Scratch Depth	Nicks Gouges		Dents Depth	Rivet Tilt
				Depth	Area		
Fig 1 (1)	Rib Zone A1	0.032	0.004	0.004	3.00	0.016	N/A
Fig 1  (2 and 31)  	Skin						
	Zone D4		0.0006	0.0006	100%		
	Zone C3		0.0006	0.0006	100%		
	Zone B3						
	Zone 01		0.0006	0.0006	100%		
	Zone 02		0.0006	0.0006	100%		
	Zone 03		0.0006	0.0006	100%		
	Zone A2						
Fig 1 (3) 	Zone 02		0.005	0.0006	100%		
	Zone 04		0.015	0.0006	100%		
	Spar						
	Zone D4		0.0006	0.0006	100%		N/A
	Zone D3		0.0006	0.0006	100%		N/A
	Zone C3		0.0006	0.0006	100%		N/A
	Zone B3		0.0006	0.0006	100%		N/A
	Zone A3						
Fig 1 (9)	Zone 01		0.0006	0.0006	100%		N/A
	Zone 02		0.010	0.010			N/A
Fig 1 (15)	Support Zone A2	0.100	0.008	0.008	2.50	0.032	N/A

Table 1. Negligible Damage Limits (Continued)

Fig No Idx No	Nomen/ Repair Zone	Thickness	Scratch Depth	Nicks Gouges		Dents Depth	Rivet Tilt
				Depth	Area		
Fig 1 (18)	Plate Zone A1	0.032	0.002	0.002	100%	0.015	
Fig 1 (20)	Rib Zone A1	0.032	0.004	0.004	4.50	0.016	N/A
Fig 1 (26)	Beam Zone C3	0.050	0.0006	0.0006	100%		N/A
	Zone B3	0.050	0.0006	0.0006	100%		N/A
	Zone A2	0.050	0.002	0.002	100%		N/A
Fig 1 (27)	Plate Zone A1	0.032	0.002	0.002	100%	0.015	
Fig 1 (29)	Skin Zone C3	0.063	0.0006	0.0006	100%		
	Zone B3	0.063	0.0006	0.0006	100%		
	Zone A2	0.063	0.002	0.002	100%	0.030	
Fig 1 (31)	Plate Zone A1	0.032	0.002	0.002	100%	0.015	
Fig 1 (36)	Seal Zone B3	0.080	0.0006	0.0006	1.50	0.025	
Fig 1 (40)	Seal Zone A2	0.080	0.007	0.007	2.50	0.025	10%
Fig 1 (42)	Support Zone A2	0.100	0.002	0.002		0.025	10%

NOTES

- Various thickness.
 See figure 4, detail A.
 1.25 square inches total combined area allowed with one pocket.
 See figure 4, detail B.
 2.50 square inches.
 None allowed.
 Remove segment of damaged or undamaged polyurethane tape to determine allowable damage limits to assembly.

Table 2. Repairable Damage Limits After Blending































































Fig No Idx No	Nomen/ Repair Zone	Thickness	Edge Nicks Depth	Scratch Depth	Nicks Gouges		Corrosion	
					Depth	Area	Depth	Area
Fig 1 (1)	Rib Zone A1	0.032		0.007	0.007		0.007	
Fig 1  (2 and 31)       	Skin							
	Zone D4			0.0006	0.0006	100%	0.0006	100%
	Zone C3			0.008	0.008		0.008	
	Zone B3							
	Zone O1			0.0006	0.0006	100%	0.0006	100%
	Zone O3			0.008	0.008		0.008	
	Zone A2							
	Zone O2		0.005	0.005	0.005		0.005	
Fig 1 (3)     	Zone O4		0.005	0.015	0.015		0.015	
	Spar							
	Zone D4		0.0006	0.0006	0.0006	100%	0.0006	100%
	Zone D3		0.0006	0.0006	0.0006	100%	0.0006	100%
	Zone C3		0.0006	0.0006	0.0006	100%	0.0006	100%
	Zone B3							
	Zone O2		0.0006	0.012	0.012		0.012	
	Zone O3		0.0006	0.016	0.016		0.016	
Fig 1 (9) 	Zone A3							
	Zone O2		0.012	0.012	0.012		0.012	
	Zone O3		0.016	0.016	0.016		0.016	
Fig 1 (15)	Support Zone A2	0.100	0.013	0.013	0.013		0.013	
Fig 1 (18) 	Plate Zone A1	0.032	0.003	0.006	0.006	100%	0.006	100%
Fig 1 (20)	Rib Zone A1	0.032	0.007	0.007	0.007		0.007	
Fig 1 (26)	Beam							
	Zone C3	0.050	0.0006	0.005	0.005	30%		
	Zone B3	0.050	0.005	0.005	0.005	30%		
Fig 1 (27) 	Zone A2	0.050	0.005	0.010	0.010	30%		
	Plate Zone A1	0.032	0.003	0.006	0.006	100%	0.006	100%

Table 2. Repairable Damage Limits After Blending (Continued)

Fig No Idx No	Nomen/ Repair Zone	Thickness	Edge Nicks Depth	Scratch Depth	Nicks Gouges		Corrosion	
					Depth	Area	Depth	Area
Fig 1 20 (29)	Skin							
18	Zone C3	0.063	0.0006	0.006	0.006	16	17	16
18	Zone B3	0.063	0.006	0.006	0.006	16	17	16
18	Zone A2	0.063	0.006	0.012	0.012	16	17	16
Fig 1 (31) 18	Rib Zone A1	0.032	0.003	0.006	0.006	100%	0.006	100%
Fig 1 (36) 19	Seal Zone B3	0.080	0.011	0.011	0.011	11	0.011	11
Fig 1 (40) 10	Seal Zone A2	0.080	0.011	0.011	0.011	9	0.011	9
Fig 1 (42) 18	Support Zone A2	0.100	0.010	0.020	0.020	9	10	9

NOTES

- 1 Various thickness.
- 2 12.0 square inches combined total within zone, no more than 3.0 square inches in any 12.0 inch diameter.
- 3 9.0 square inches combined total within zone, no more than 3.0 square inches in outboard section.
- 4 0.25 inch diameter hole, must be 1.0 inch from any chem mill step and 0.5 inches from any edge of part.
- 5 2.5 square inches combined total within zone.
- 6 7.0 square inches combined total area allowed in one pocket.
- 7 0.25 inch diameter hole must be 1.0 inch from spar and 0.75 inch from vertical stiffener.
Hole must be plugged/sealed.
- 8 10.0 square inches combined total area allowed in one pocket.
- 9 4.0 square inches combined total allowed on the part.
- 10 0.25 inch diameter hole, must be 0.50 from any edge and 0.75 inches from any fastener.
- 11 2.5 square inches combined total allowed on the part.
- 12 6.0 square inches combined total allowed on the part.
- 13 4.5 square inches combined total allowed on the part.
- 14 See figure 4, detail A.
- 15 See figure 4, detail B.
- 16 1.8 square inches total combined area contained within any 30 inch length.
- 17 0.25 inch diameter hole, must be 0.38 inches from any edge. Hole must be plugged/sealed.
- 18 Holes must be repaired, depot engineering disposition required for exceptions.
- 19 None allowed.
- 20 Remove segment of damaged or undamaged polyurethane tape to determine allowable damage limits to assembly.

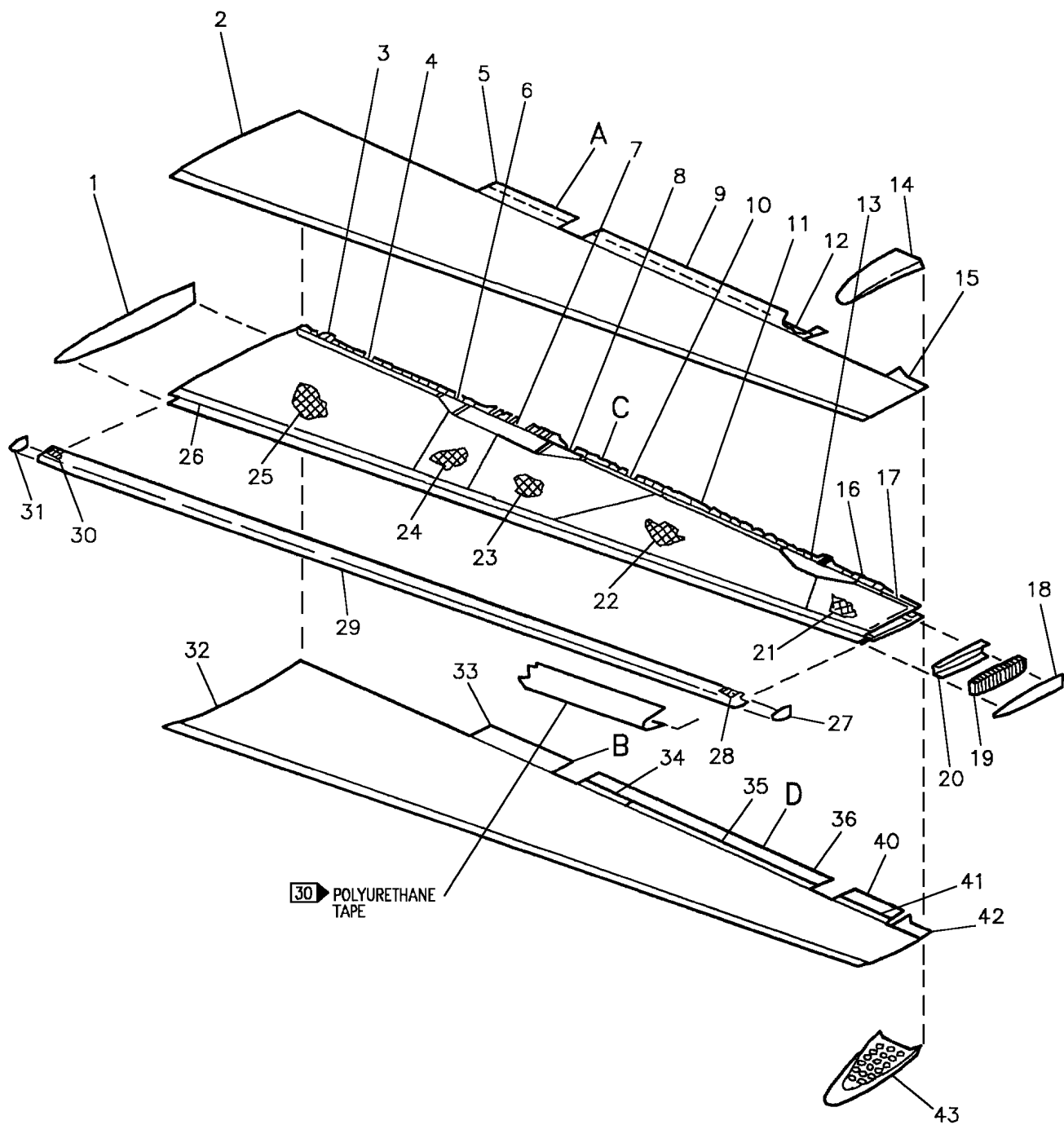


Figure 1. Material Index (Sheet 1)

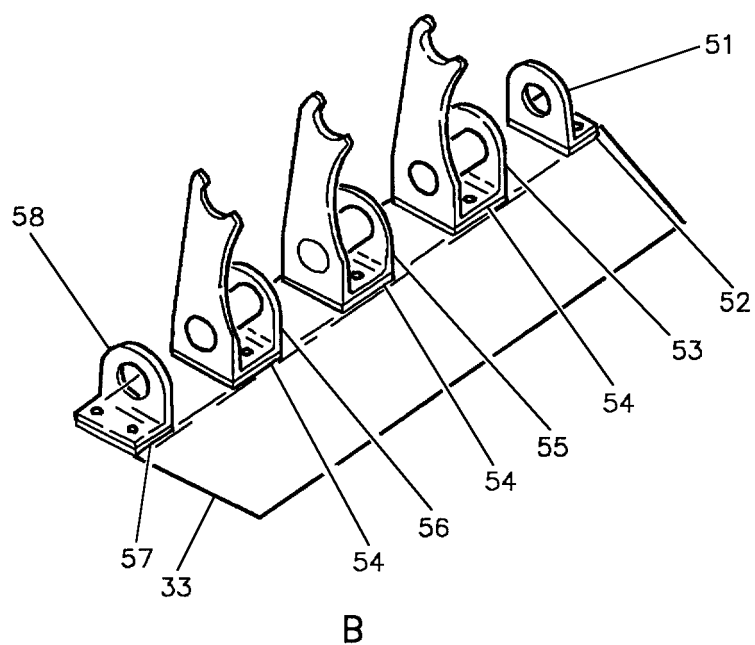
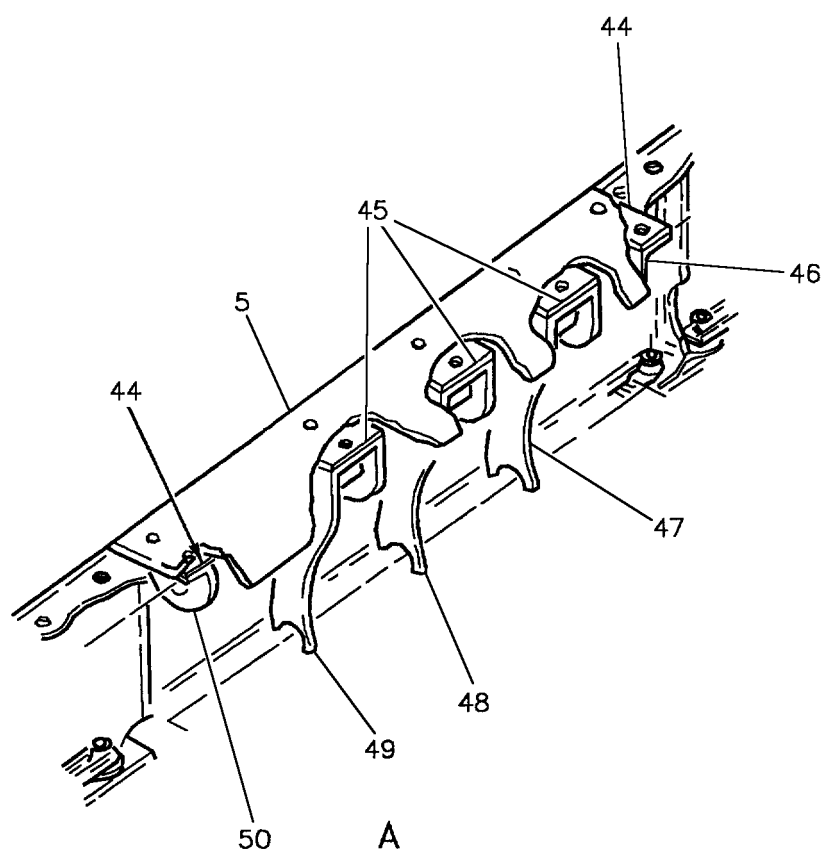


Figure 1. Material Index (Sheet 2)

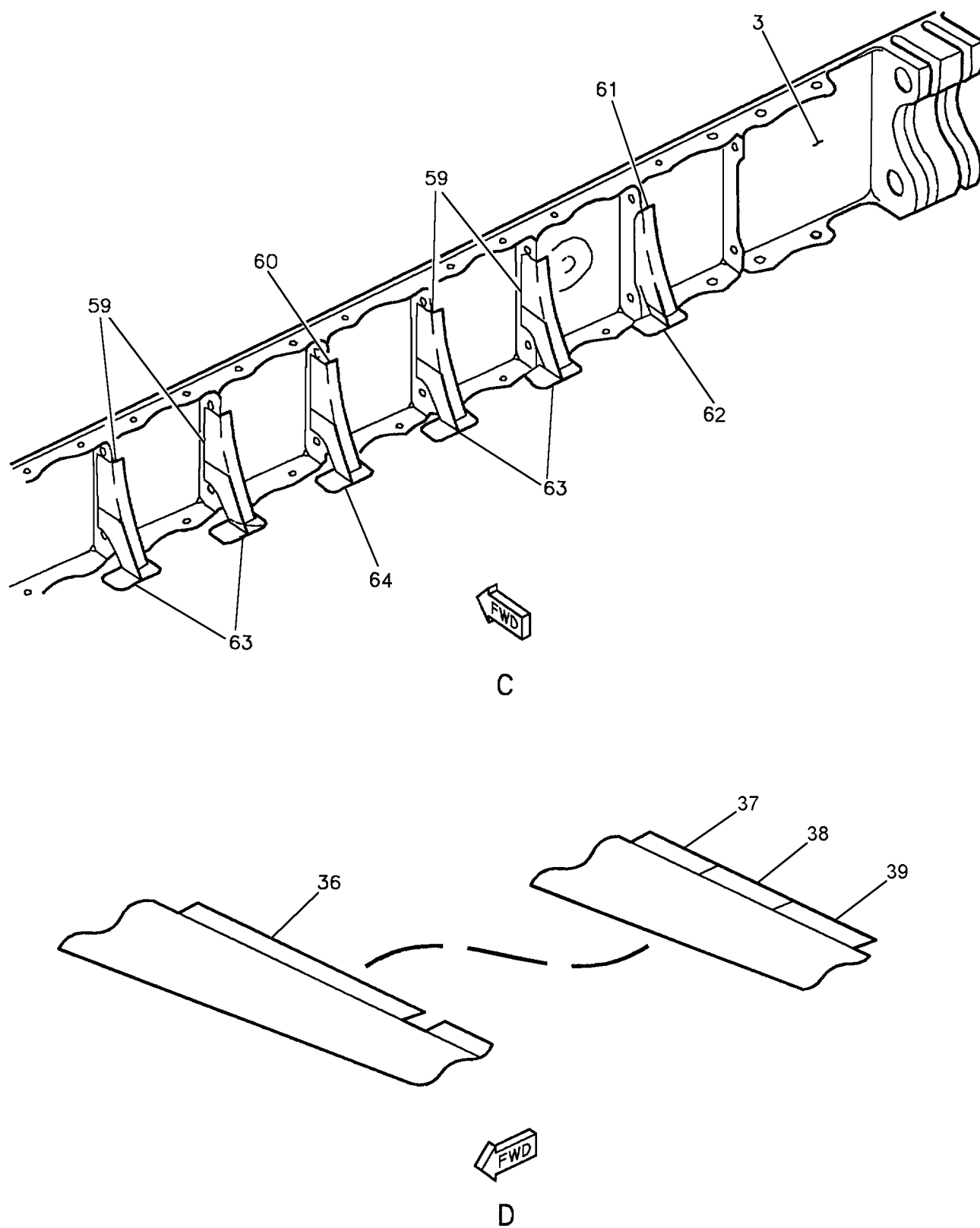


Figure 1. Material Index (Sheet 3)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
1		Rib 74A190665-2003, -2004	0.032 Sheet	7075-T6 Alclad
2	<div>36</div> <div>37</div> <div>38</div> <div>39</div>	Skin 74A190670-2001 74A190670-2002 74A190670-2003 74A190670-2004	0.249 Sheet	7075-T76 Alclad
3	<div>14</div> <div>15</div> <div>16</div> <div>17</div>	Spar 74A190664-2001 74A190664-2003 74A190664-2004 74A190664-2005, -2006	Forging	7075-T411 Al Aly
4		Core 74A190672-2011, -2012	<div>1</div>	5056-H39 Al Aly
5		Seal 74A190618-2005, -2006	0.071 Sheet	7075-T6 Alclad
6		Core 74A190672-2013, -2014	<div>2</div>	5056-H39 Al Aly
7		Core 74A190672-2015, -2016	<div>2</div>	5056-H39 Al Aly
8		Core 74A190672-2017, -2018	<div>2</div>	5056-H39 Al Aly
9	<div>6</div> <div>7</div>	Seal 74A190627-2005, -2006 74A190627-2007, -2008	0.080 Sheet	7075-T6 Alclad
10		Core 74A190672-2019, -2020	<div>2</div>	5056-H39 Al Aly
11		Core 74A190672-2021, -2022	<div>3</div>	5056-H39 Al Aly
12	<div>31</div>	Shim 74A190627-2009	0.025 Sheet	5052-H39 Al Lam
13		Core 74A190672-2023, -2024	<div>3</div>	5056-H39 Al Aly
14	<div>12</div> <div>13</div>	Fairing 74A190673-1005, -1006 74A190673-1007, -1008	0.060 Sheet	<div>4</div>
15	<div>24</div> <div>25</div>	Support 74A190632-2011, -2012 74A190632-2015, -2016	0.100 Sheet	7075-T76 Alclad

Figure 1. Material Index (Sheet 4)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
16	 	Core 74A190672-2025, -2026 74A190672-2029, -2030		5056-H39 Al Aly
17	 	Core 74A190672-2027, -2028 74A190672-2031, -2032		5056-H39 Al Aly
18		Plate 74A190676-2001, -2002	0.032 Sheet	7075-T76 Alclad
19		Core 74A190675-2001, -2002		5056-H39 Al Aly
20	 	Rib 74A190666-2001 74A190666-2002 74A190666-2003 74A190666-2004	0.032 Sheet	7075-T6 Alclad
21	 	Core 74A190672-2009 74A190672-2010 74A190672-2041 74A190672-2042		5056-H39 Al Aly
22	 	Core 74A190672-2007 74A190672-2008 74A190672-2039 74A190672-2040		5056-H39 Al Aly
23	 	Core 74A190672-2005 74A190672-2006 74A190672-2037 74A190672-2038		5056-H39 Al Aly
24	 	Core 74A190672-2003 74A190672-2004 74A190672-2035 74A190672-2036		5056-H39 Al Aly
25	 	Core 74A190672-2001 74A190672-2002 74A190672-2033 74A190672-2034		5056-H39 Al Aly
26		Beam 74A190668-2001, -2002	0.050 Sheet	7075-T6 Alclad

Figure 1. Material Index (Sheet 5)



Idx No.	Eft	Nomenclature and Part No.	Description	Material
27		Plate 74A190676-2009	0.032 Sheet	7075-T6 Alclad
28		Core 74A190675-2005, -2006		5056-H39 Al Aly
29		Skin 74A190669-2001, -2002	0.063 Sheet	7075-T6 Alclad
30		Core 74A190675-2011, -2012		5056-H39 Al Aly

Figure 1. Material Index (Sheet 6)




















Idx No.	Eft	Nomenclature and Part No.	Description	Material
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33	 	Seal 74A190616-2009, -2010 74A190616-2011, -2012	0.112 Sheet	6AL-4V Ti Anl
34		Shim 74A190617-2009	0.025 Sheet	5052-H39 Al Lam
35		Shim 74A190617-2011	0.025 Sheet	5052-H39 Al Lam
36	   	Seal 74A190617-2005 74A190617-2006 74A190617-2007 74A190617-2008	0.080 Sheet 0.080Sheet	7075-T76 Alclad 7075-T6 Alclad
37		Seal 74A190617-2013, -2014	0.080 Sheet	7075-T6 Alclad
38		Seal 74A190617-2015, -2016	0.080 Sheet	7075-T6 Alclad
39		Seal 74A190617-2017, -2018	0.080 Sheet	7075-T6 Alclad
40		Seal 74A190623-2007, -2008	0.080 Sheet	7075-T76 Alclad
41		Shim 74A190623-2009	0.025 Sheet	5052-H39 Al Lam
42	 	Support 74A190632-2009, -2010 74A190632-2013, -2014	0.100 Sheet	7075-T76 Alclad
43	 	Fairing 74A190674-1005, -1006 74A190674-1007, -1008	0.060 Sheet	
44		Shim 74A190678-2007	0.032 Sheet	5052-H39 Al Lam

Figure 1. Material Index (Sheet 7)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
45		Shim 74A190678-2003	0.032 Sheet	5052-H39 Al Lam
46		Support 74A190677-2015, -2016	1MA100D06-10375 Extrusion	7075-T76511 Al Aly
47		Support 74A190677-2011, -2012	1MA120D06-10309 Extrusion	7075-T76511 Al Aly
48		Support 74A190677-2009, -2010	1MA120D06-10309 Extrusion	7075-T76511 Al Aly
49		Support 74A190677-2007, -2008	1MA120D06-10309 Extrusion	7075-T76511 Al Aly
50		Support 74A190677-2019, -2020	1MA100D06-10375 Extrusion	7075-T76511 Al Aly
51		Support 74A190677-2013, -2014	1MA100D06-10375 Extrusion	7075-T76511 Al Aly
52		Shim 74A190678-2005	0.032 Sheet	5052-H39 Al Lam
53		Support 74A190677-2005, -2006	1MA120D06-10308 Extrusion	7075-T76511 Al Aly
54		Shim 74A190678-2001	0.032 Sheet	5052-H39 Al Lam
55		Support 74A190677-2003, -2004	1MA120D06-10308 Extrusion	7075-T76511 Al Aly
56		Support 74A190677-2001, -2002	1MA120D06-10308	7075-T76511 Al Aly
57		Shim 74A190678-2009	0.032 Sheet	5052-H39 Al Lam
58		Support 74A190677-2017, -2018	1MA100D06-10375 Extrusion	7075-T76511 Al Aly

Figure 1. Material Index (Sheet 8)
































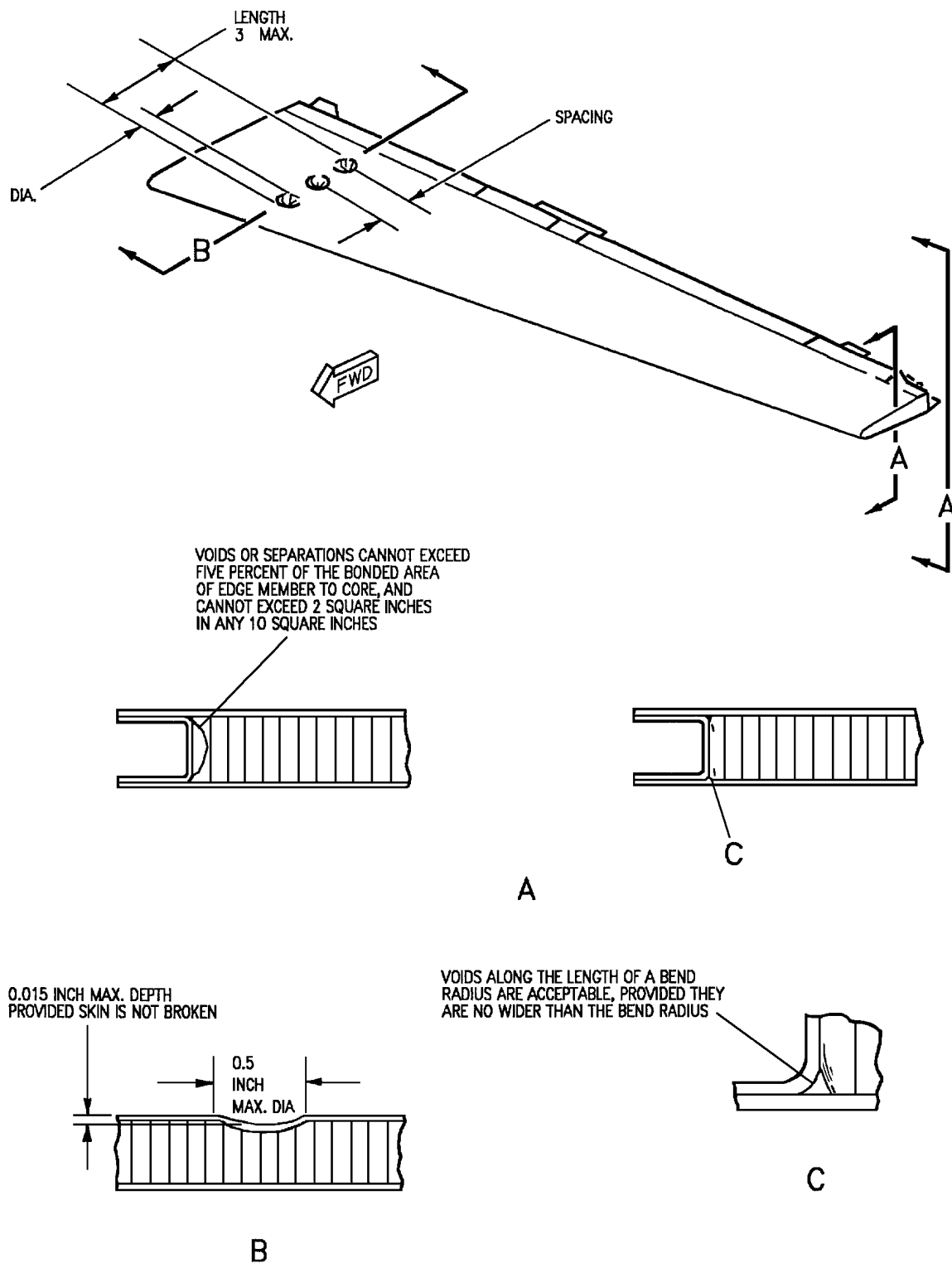
Idx No.	Eft	Nomenclature and Part No.	Description	Material
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60	 	Bracket 74A190653-2047 74A190653-2048	0.063 Sheet	7075-T76 Alclad
61	 	Bracket 74A190653-2051 74A190653-2052	0.063 Sheet	7075-T76 Alclad
62		Tee 74A190653-2055	1MA160D03-10277 Extrusion	7075-T6511 Al Aly
63		Tee 74A190653-2057	1MA160D03-10277 Extrusion	7075-T6511 Al Aly
64		Tee 74A190653-2053	1MA160D03-10277 Extrusion	7075-T6511 Al Aly
<p style="text-align: center;">LEGEND</p> <p> 5/32 hexcell 0.0010 nonperforated honeycomb.  1/8 hexcell 0.0020 nonperforated honeycomb.  3/16 hexcell 0.0020 nonperforated honeycomb.  Lexan F-60011 Polycarbonate.  3/16 hexcell 0.0010 nonperforated honeycomb.  161520 THRU 161736.  161737 AND UP.  161520 THRU 162414.  162415 AND UP.  161520 THRU 161528.  161702 AND UP.  161520 THRU 162426.  162427 AND UP.  161751 ONLY.  161520 THRU 161750, 161752 THRU 162868, 162898, 163092.  161520 THRU 162868, 162898, 163092.  162869 THRU 162897, 162899 THRU 162909, 163093 AND UP.  161520 THRU 161528, 161751.  161702 THRU 161750, 161752 AND UP.  161520 THRU 162848, 162851 THRU 162852, 162863, 162898, 162901, 163092.  162520 THRU 162846, 162848 THRU 162852, 162863, 162898, 162901, 163092.  162849, 162853 THRU 162862, 162865 THRU 162897, 162899 THRU 162900, 162902 THRU 162909, 163093 AND UP.</p>				

Figure 1. Material Index (Sheet 9)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
23		162847, 162853 THRU 162862, 162865 THRU 162897, 162899 THRU 162900, 162902 THRU 162909, 163093 AND UP.		
24		161520 THRU 162878.		
25		162879 AND UP.		
26		161520 THRU 162852, 162863, 162898, 163092, 163105, 163112.		
27		162853 THRU 162862, 162865 THRU 162897, 162899 THRU 162900, 162902 THRU 162909, 163093 THRU 163103, 163106 THRU 163111, 163113 AND UP.		
28		161520 THRU 162866, 162869, 162898, 162901, 163105, 163112, 163128, 163139, BEFORE F/A-18 AFC 159.		
29		161520 THRU 162868, 162898, 162901, 163128, BEFORE F/A-18 AFC 159.		
30		For application of polyurethane tape (A1-F18AC-SRM-500, WP027 00).		
31		163135 AND UP.		
32		162867, 162868, 162870 THRU 162888, 162890 THRU 162897, 162899, 162900, 162902 THRU 163104, 163106 THRU 163111, 163113 THRU 163127, 163129 THRU 163138, 163140 AND UP, BEFORE F/A-18 AFC 159.		
33		162869 THRU 162897, 162899, 162900, 162902 THRU 163127, 163129 AND UP, BEFORE F/A-18 AFC 159.		
34		161520 THRU 163150.		
35		163151 AND UP.		
36		161520 THRU 162866, 162869, 162889, 162898, 162901, 163128, 163139.		
37		161520 THRU 162868, 162898, 162901, 163128.		
38		161867 THRU 162868, 162870 THRU 162888, 162890 THRU 162897, 162899 THRU 162900, 162902 THRU 163127, 163129 THRU 163138, 163140 AND UP.		
39		162869 THRU 162897, 162899 THRU 162900, 162902 THRU 163127, 163129 AND UP.		
40		162869 THRU 162897, 162899 THRU 162900, 162902 THRU 162909, 163093 AND UP.		
41		162867 THRU 162897, 162899 THRU 162900, 162902 THRU 162909, 163093 AND UP.		
42		AFTER F/A-18 AFC 159.		

Figure 1. Material Index (Sheet 10)



0160102

Figure 2. Negligible Damage, Aluminum Skin and Aluminum Honeycomb Core

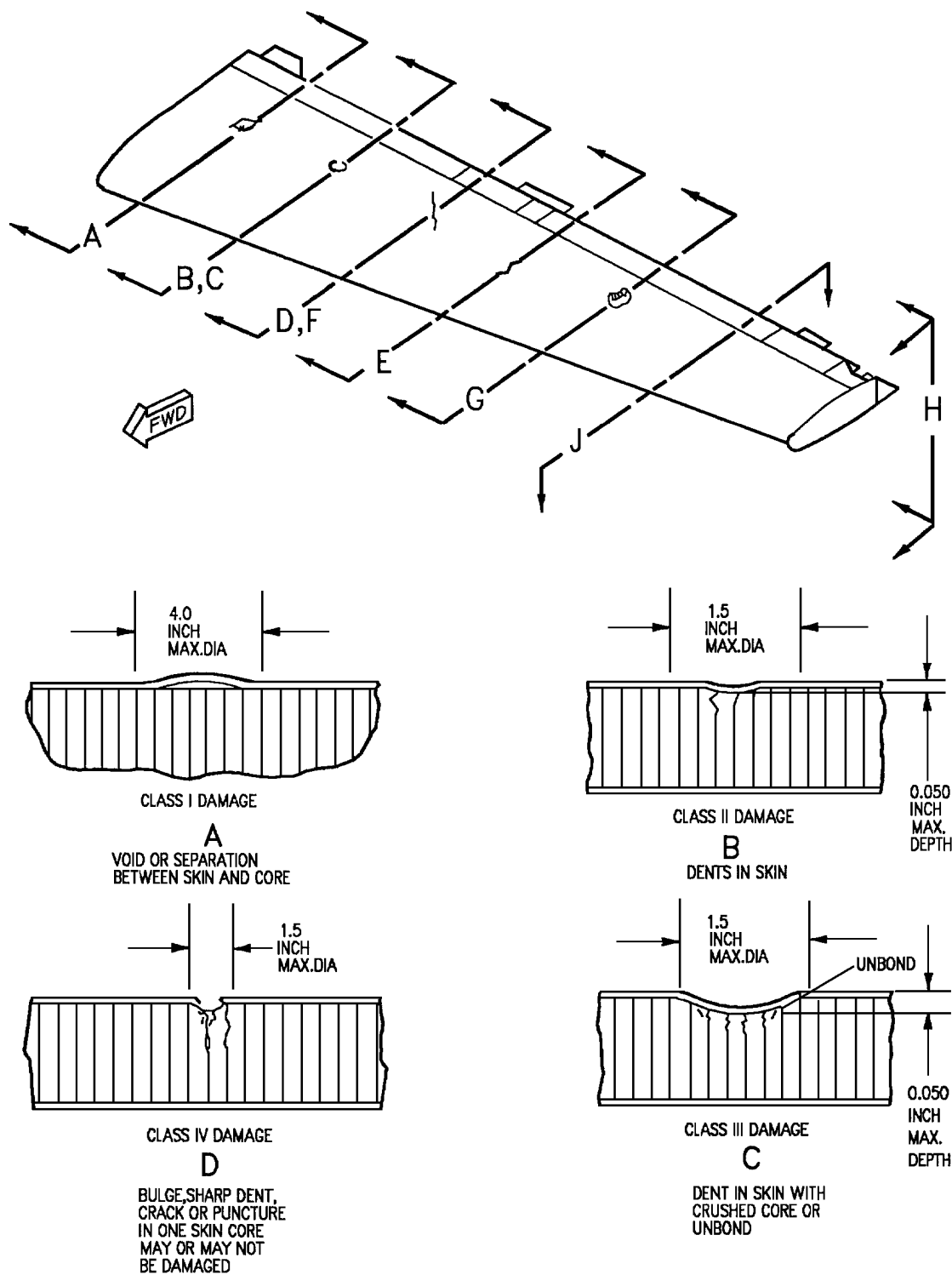


Figure 3. Repairable Damage, Aluminum Skin and Aluminum Honeycomb Core (Sheet 1)

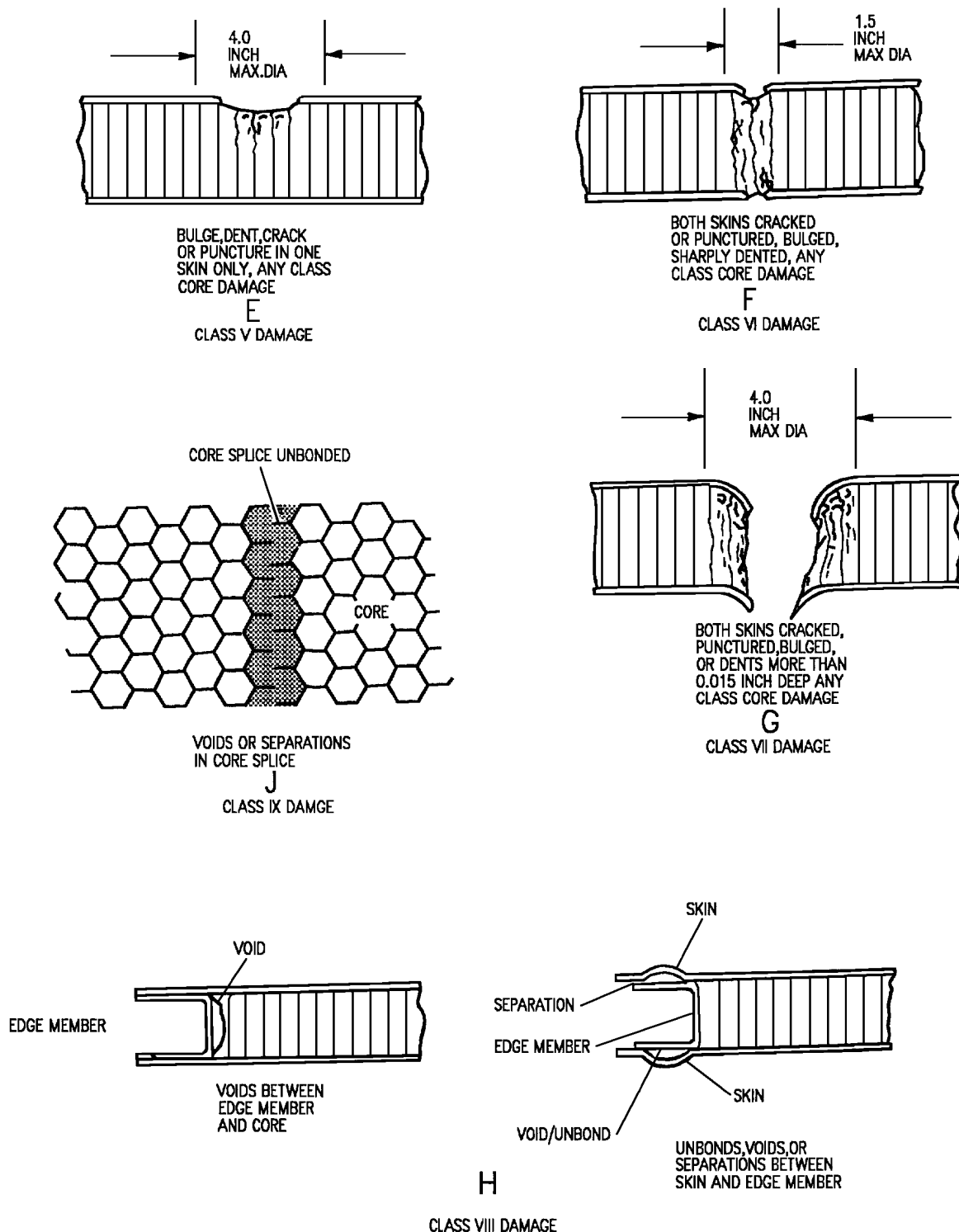


Figure 3. Repairable Damage, Aluminum Skin and Aluminum Honeycomb Core (Sheet 2)

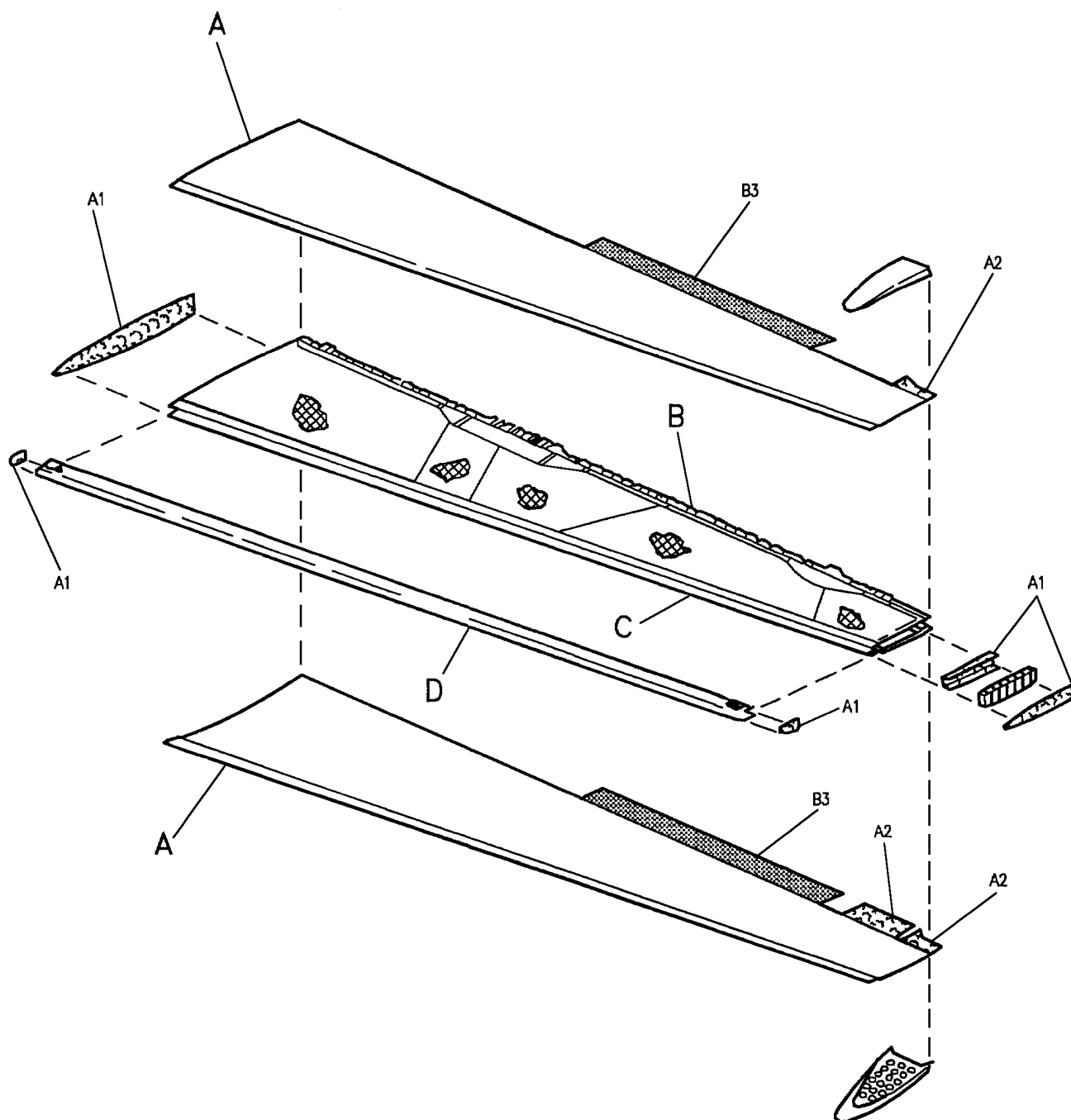
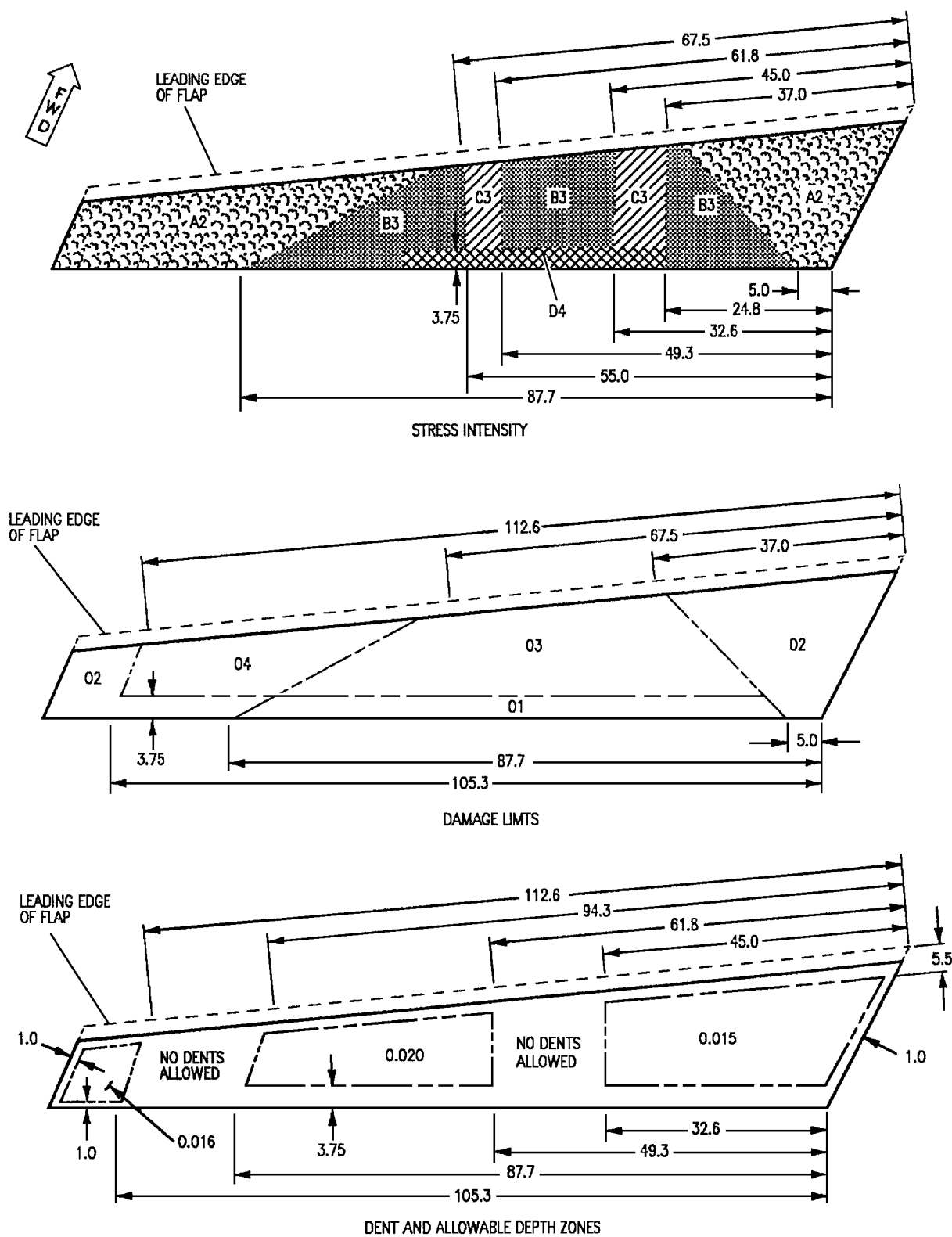


Figure 4. Repair Zones (Sheet 1)



A

Figure 4. Repair Zones (Sheet 2)

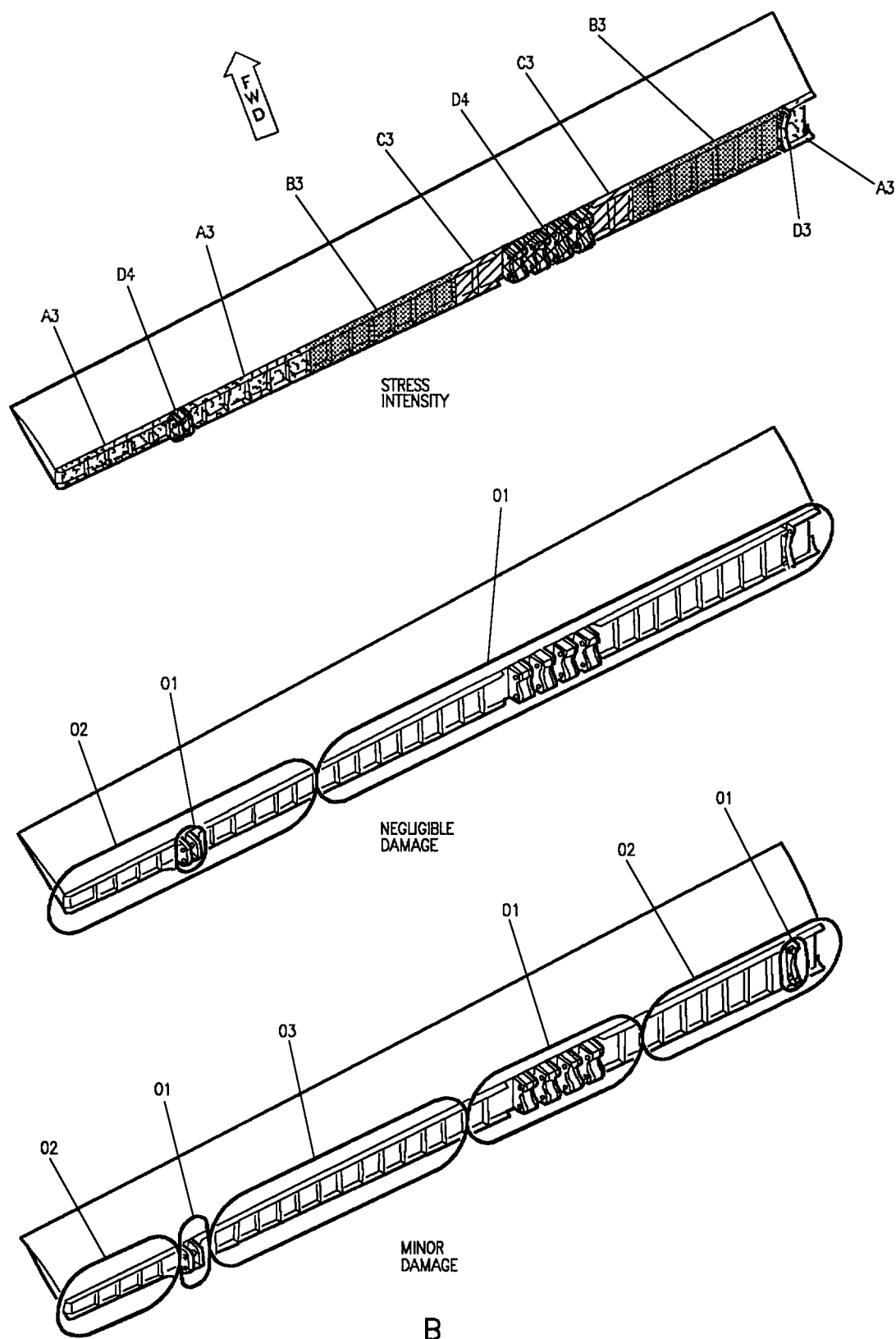
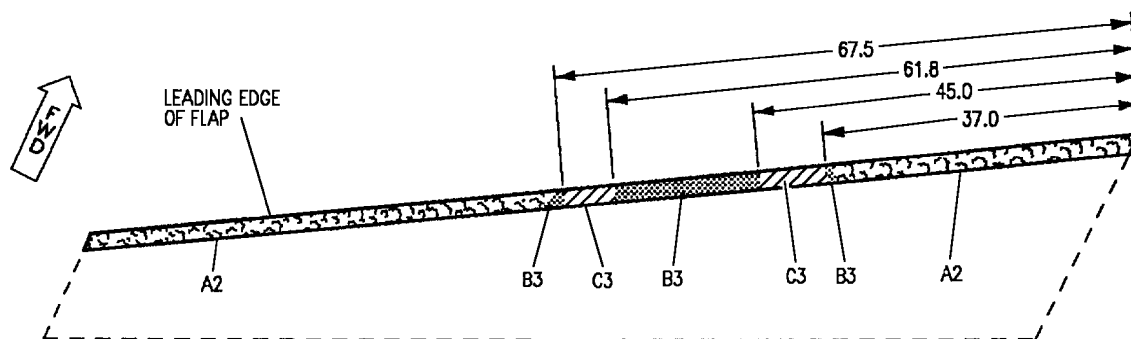
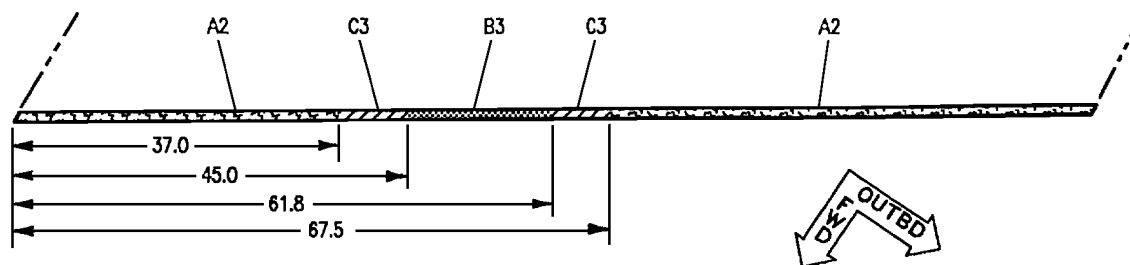


Figure 4. Repair Zones (Sheet 3)



STRESS INTENSITY

C



D

Figure 4. Repair Zones (Sheet 4)

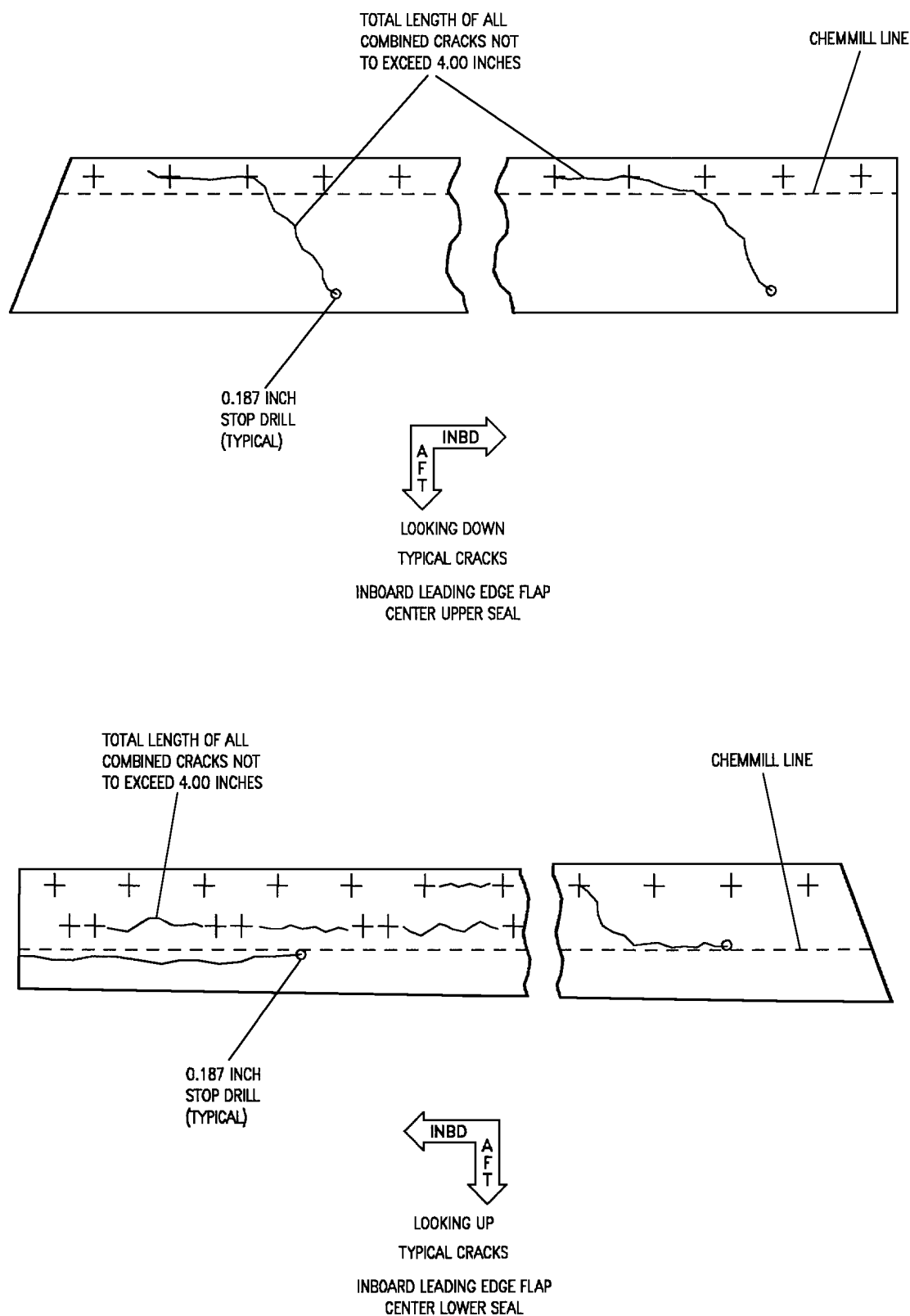


Figure 5. Seals, 74A190617 and 74A190627, Crack Repair

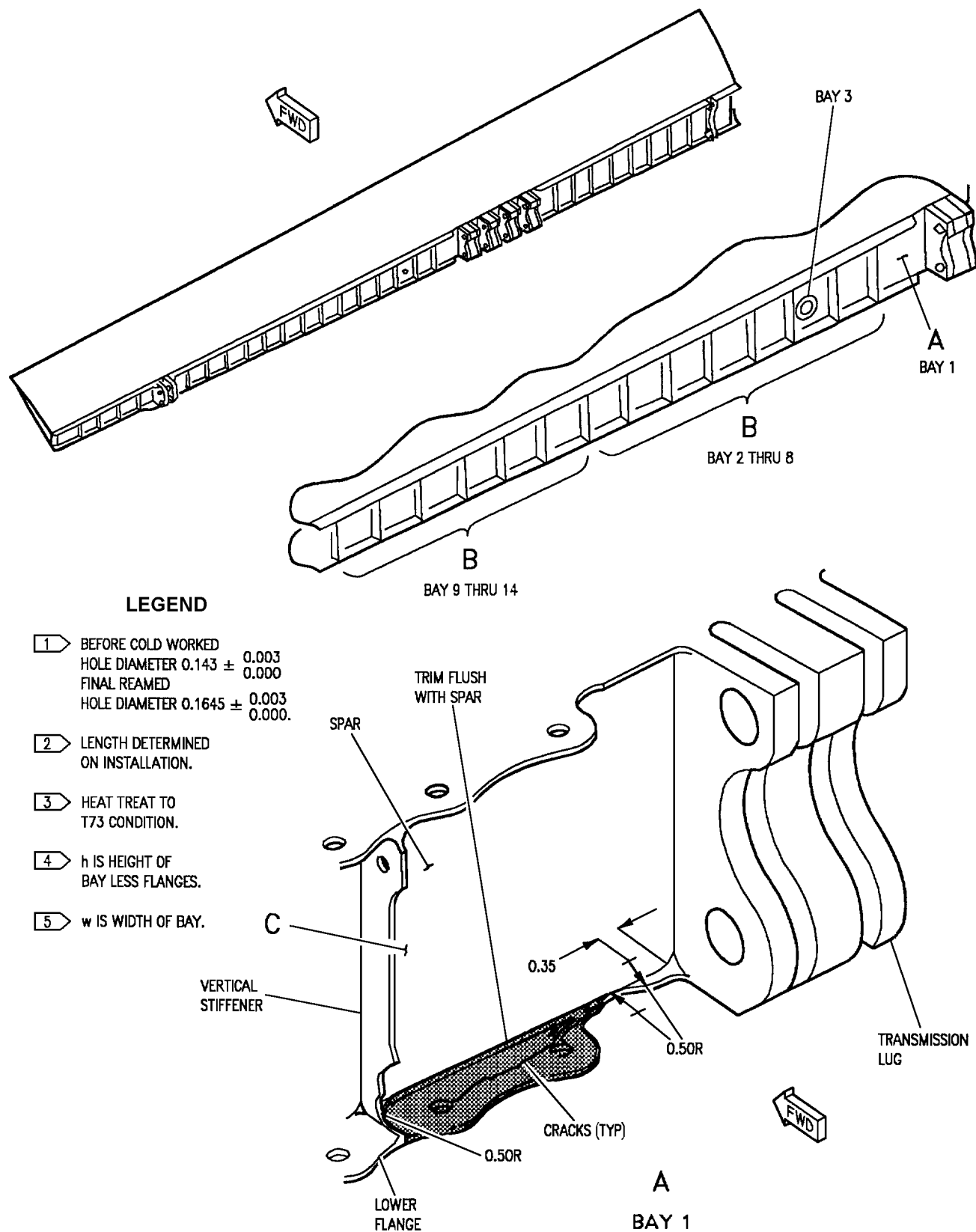


Figure 6. Spar Lower Flange Repair (Sheet 1)

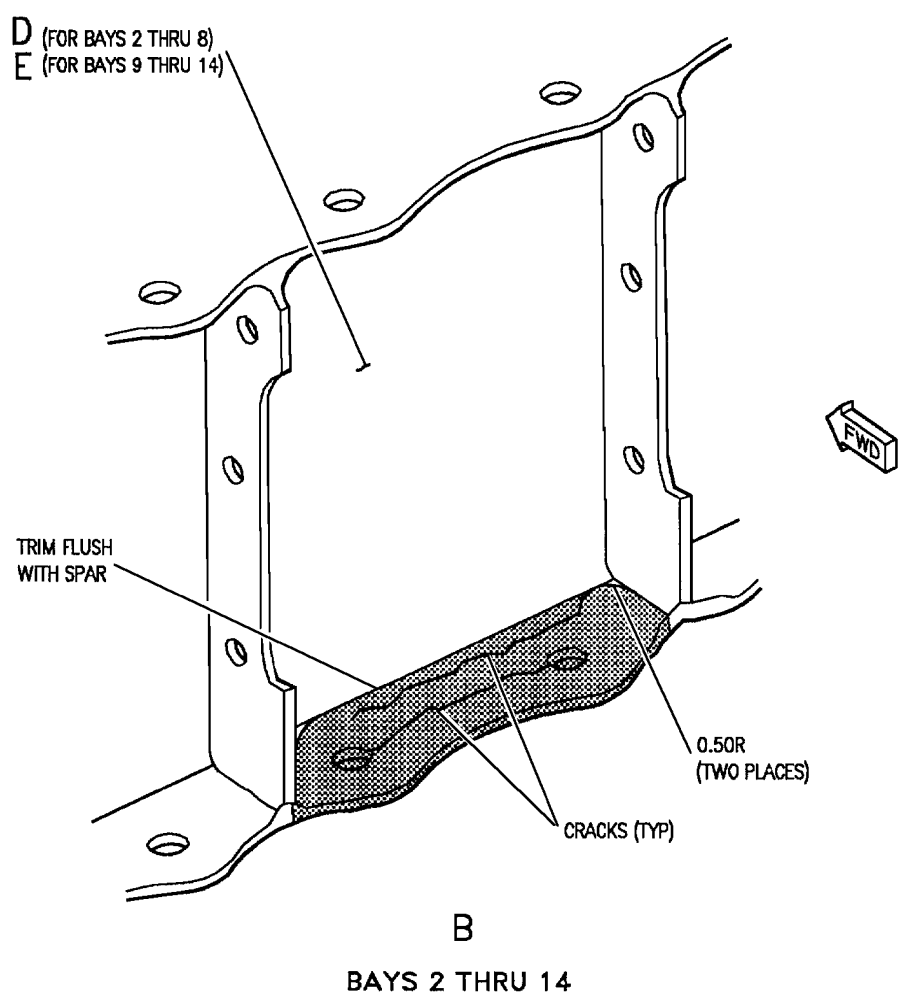


Figure 6. Spar Lower Flange Repair (Sheet 2)

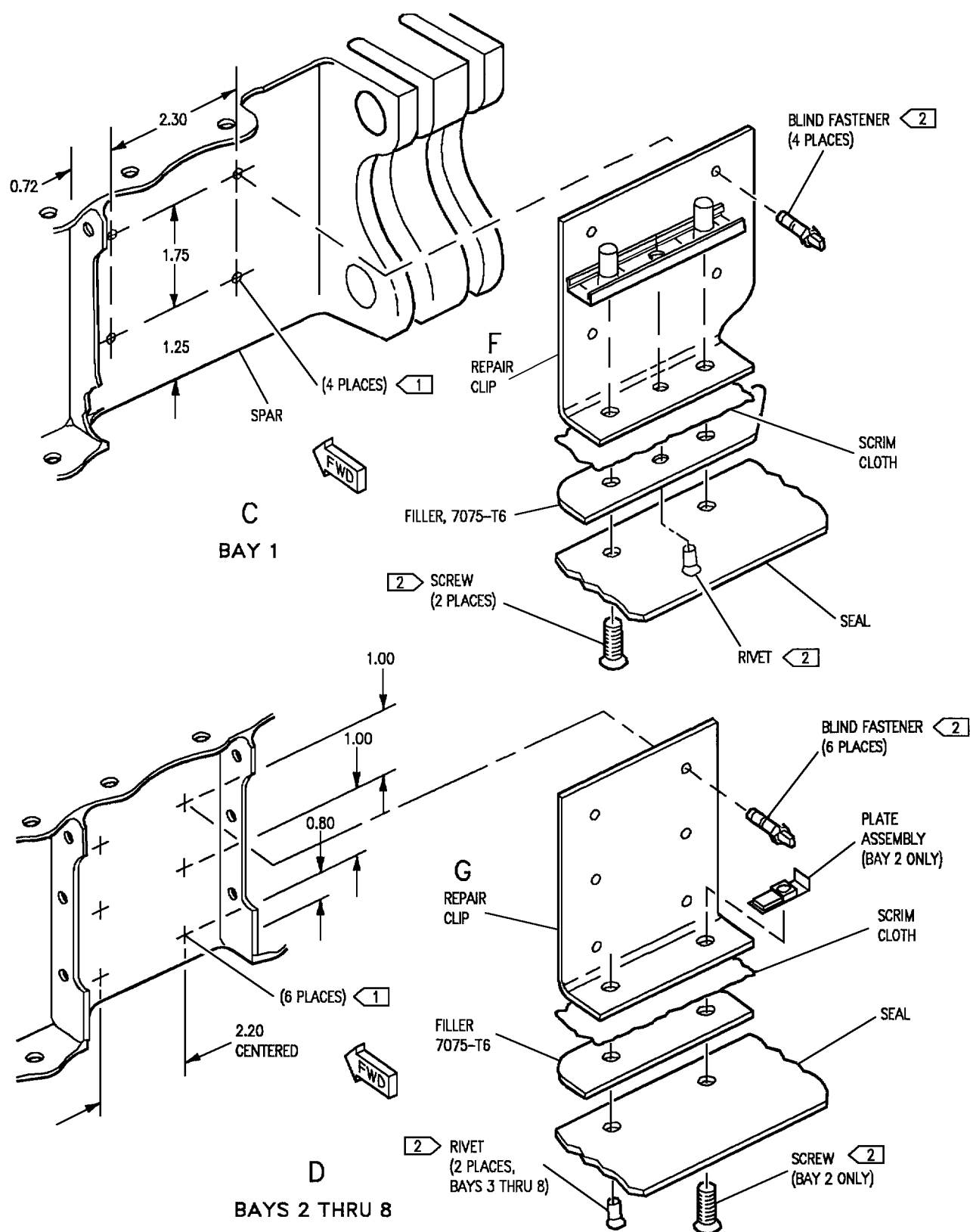


Figure 6. Spar Lower Flange Repair (Sheet 3)

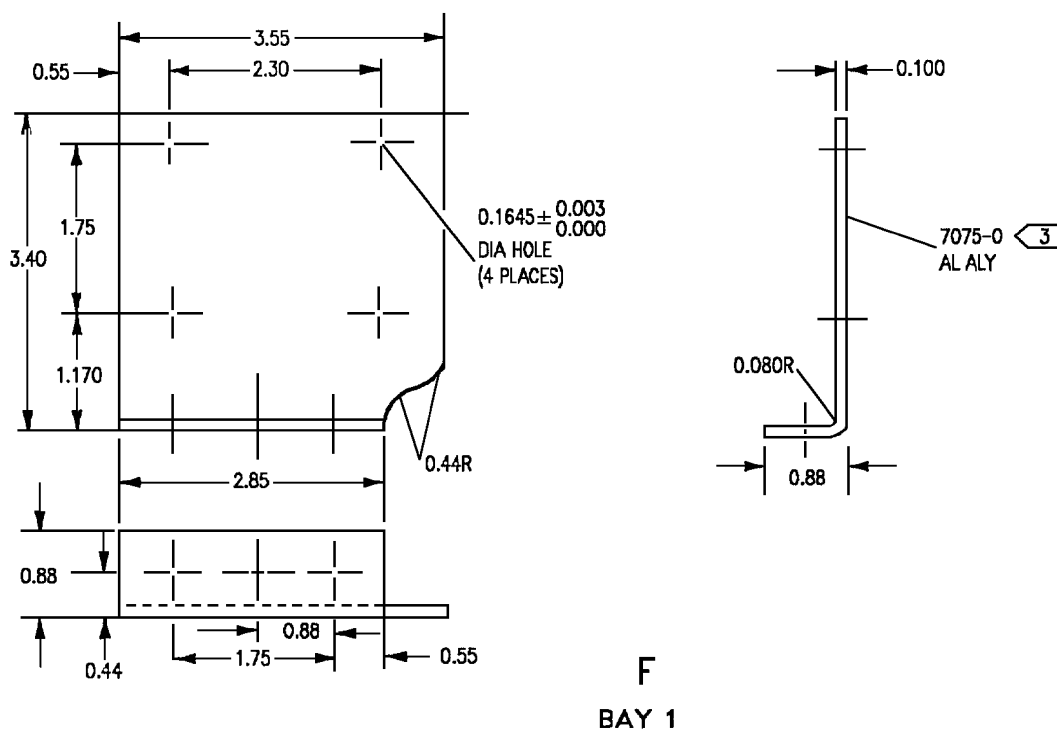
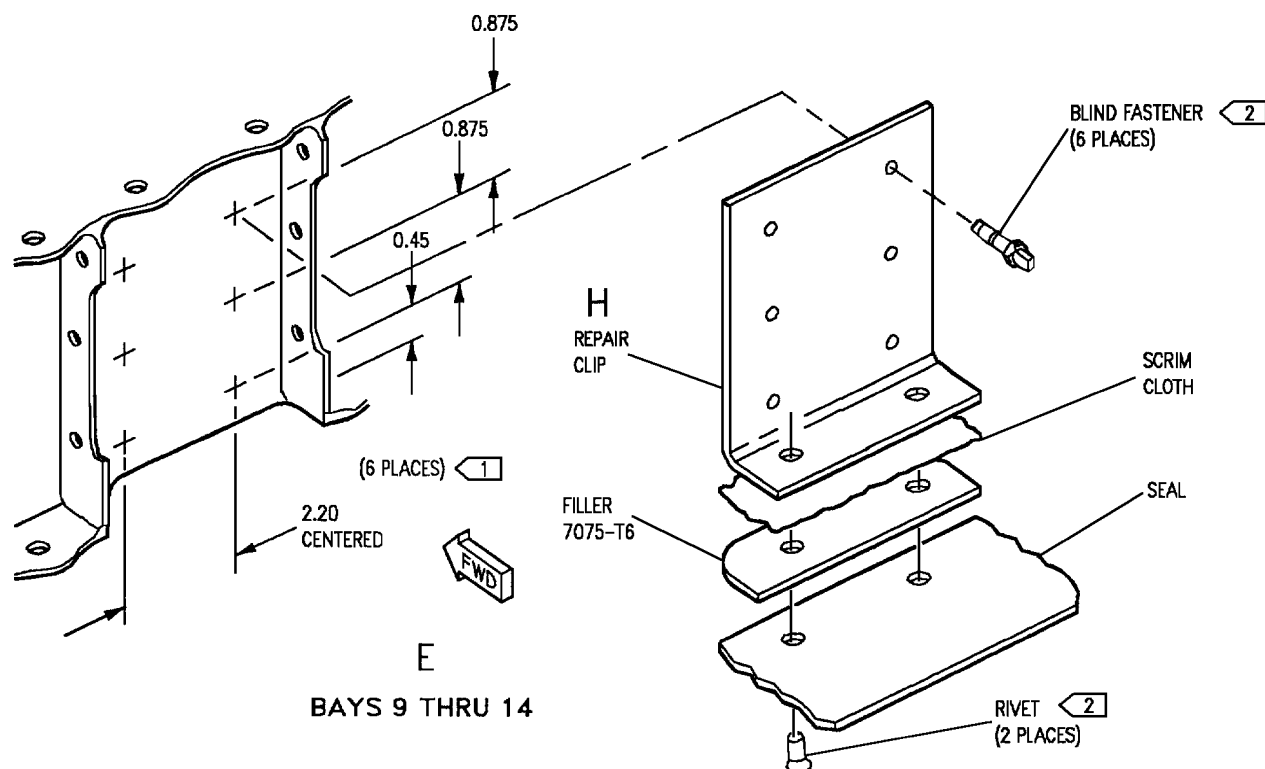
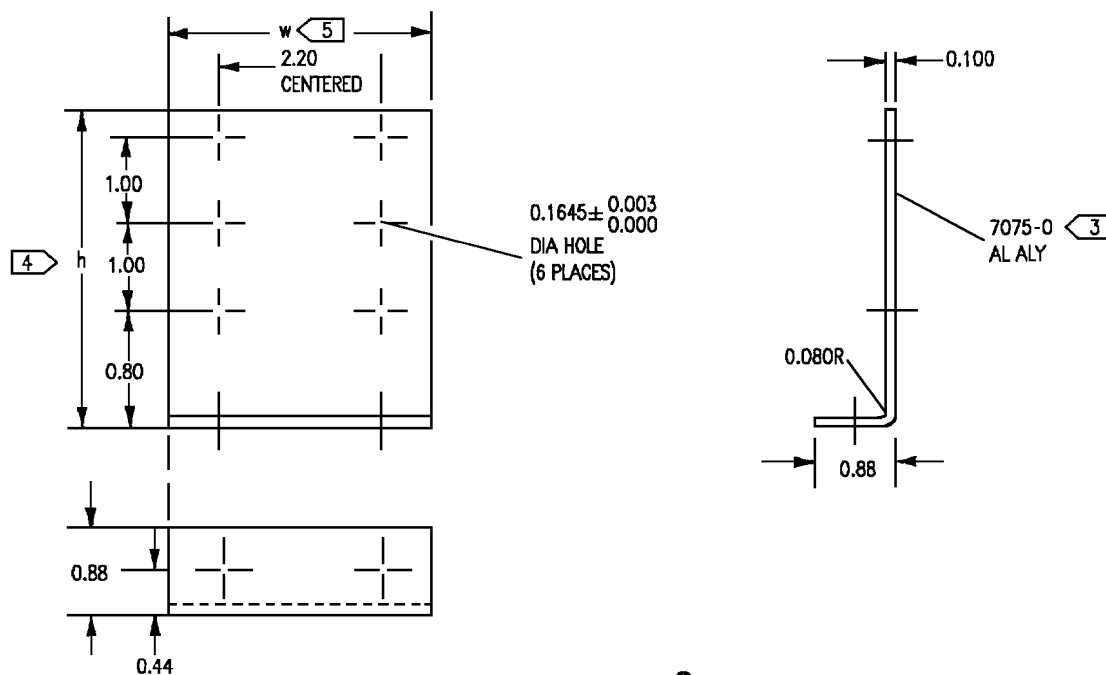
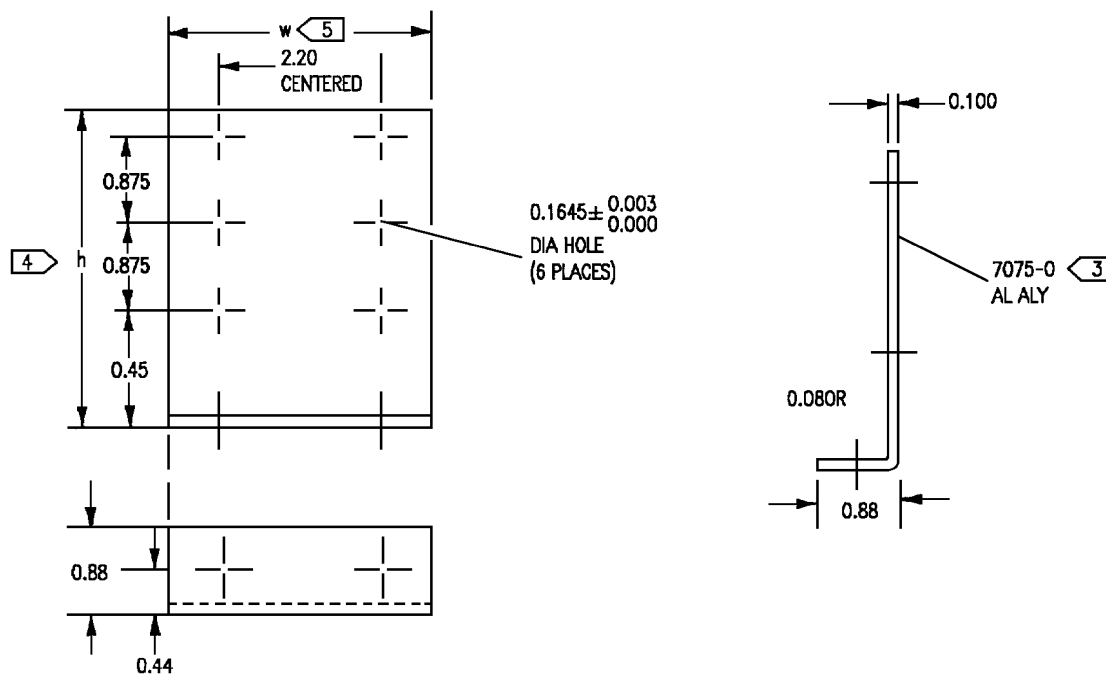


Figure 6. Spar Lower Flange Repair (Sheet 4)



G

BAYS 2 THRU 8



H

BAYS 9 THRU 14

Figure 6. Spar Lower Flange Repair (Sheet 5)

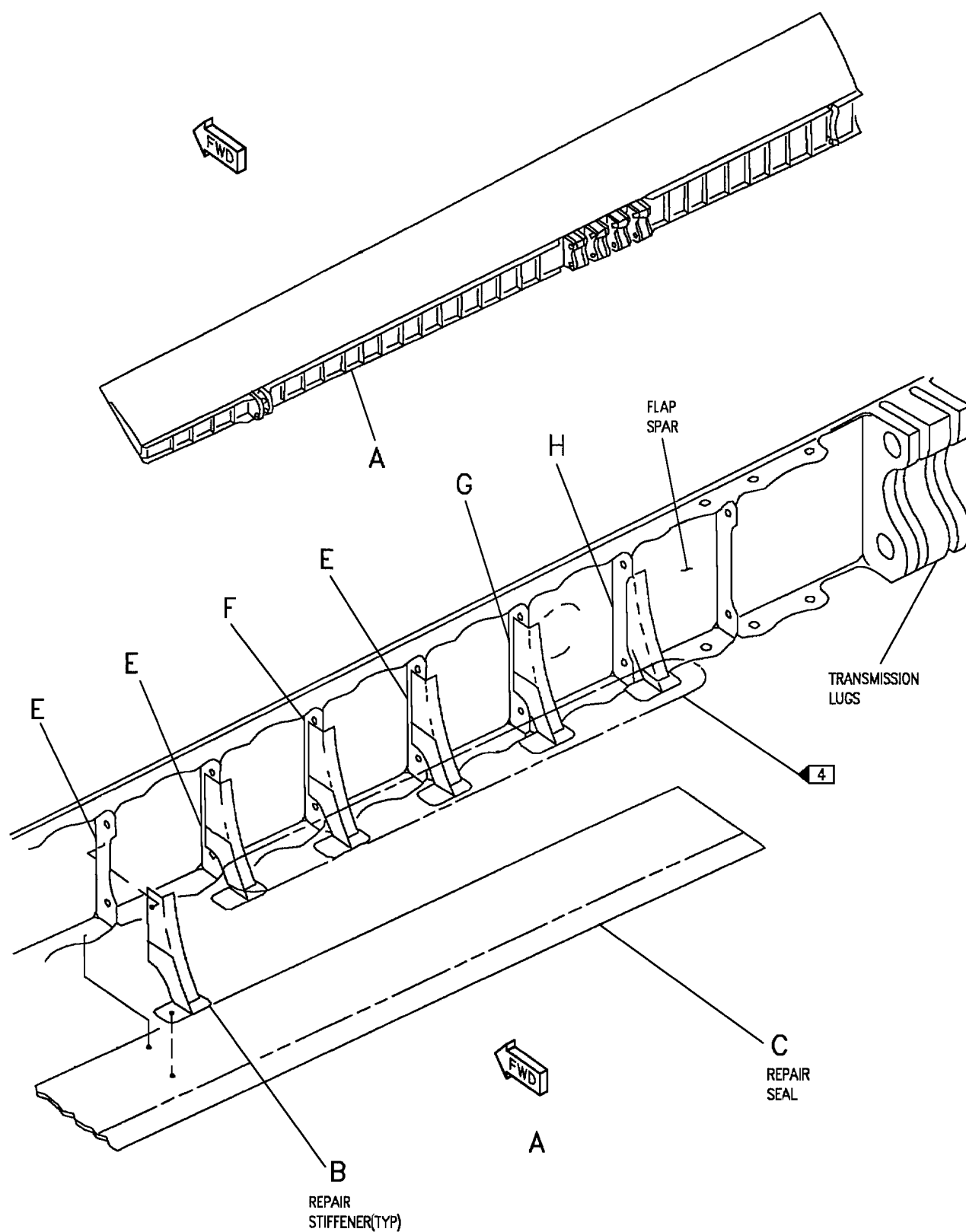
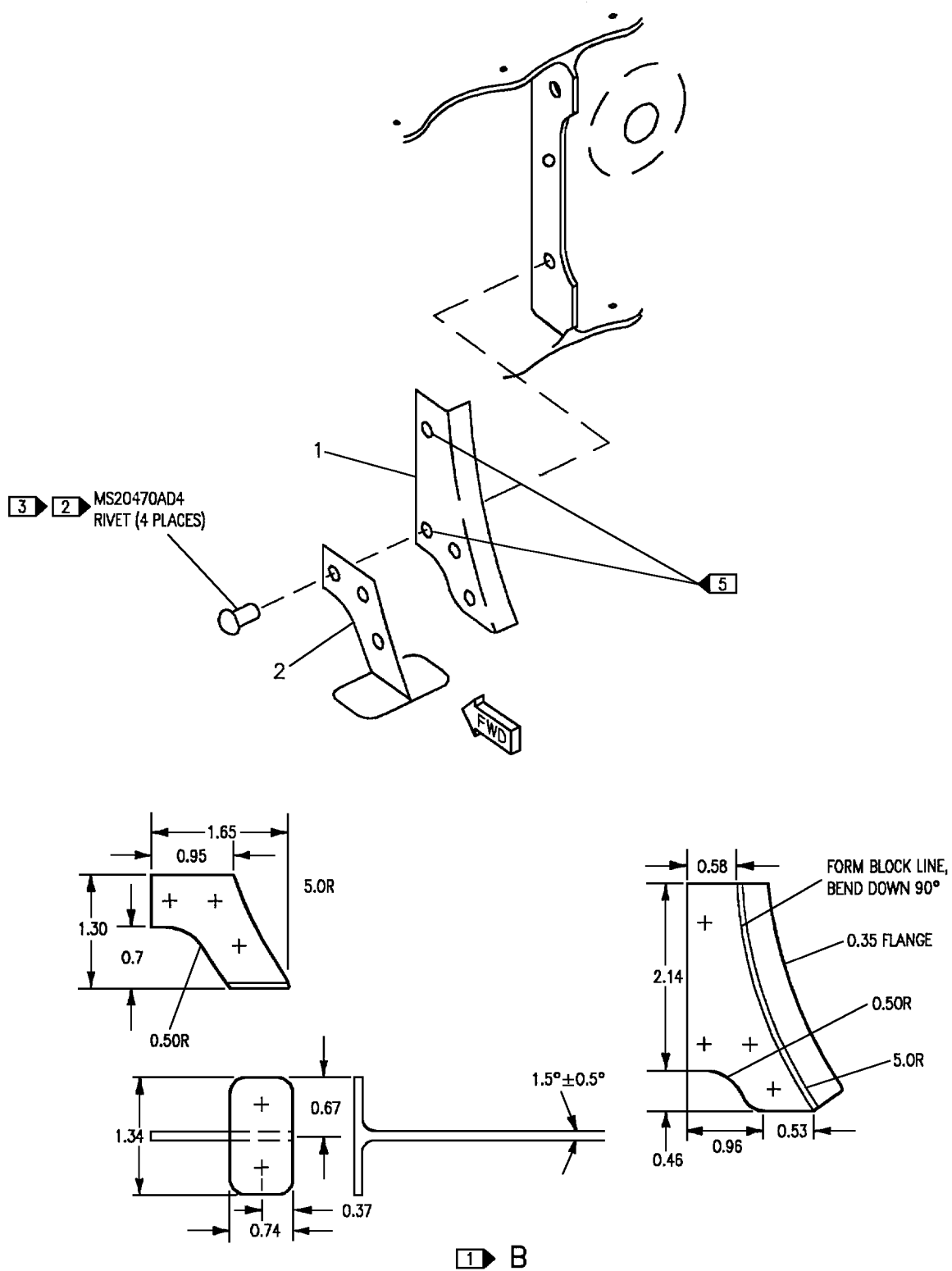


Figure 7. Seal, 74A190617, Repair (Sheet 1)



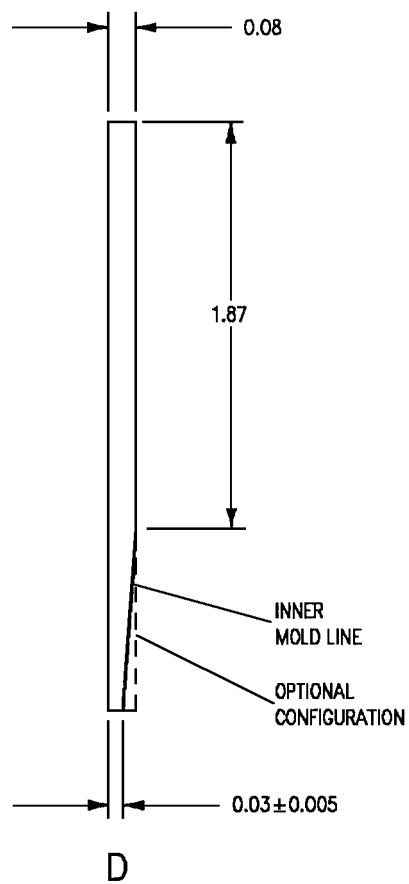
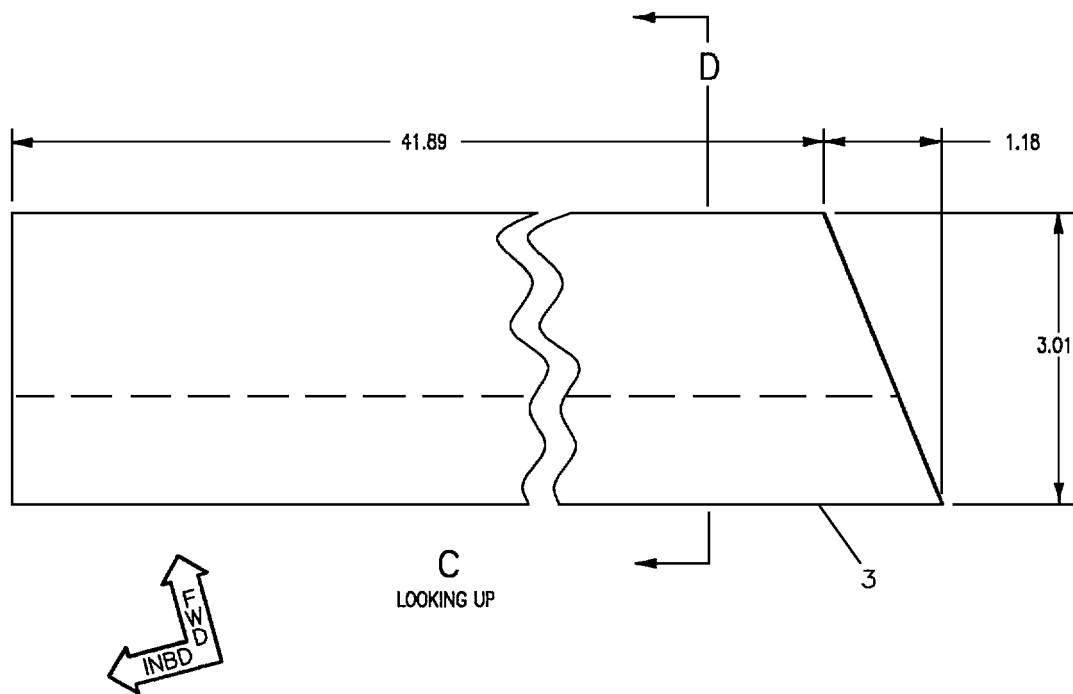
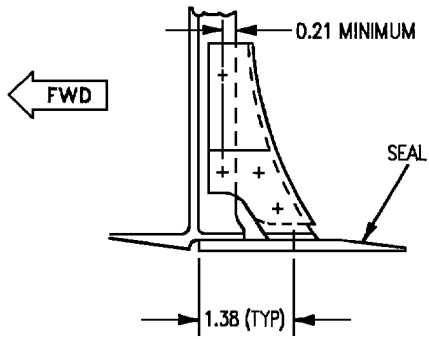
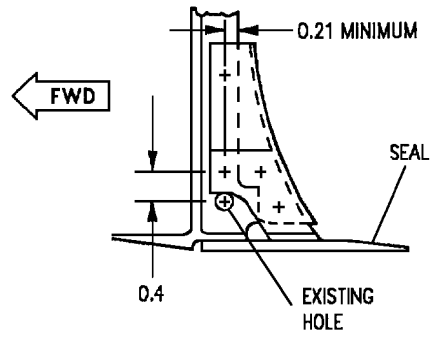


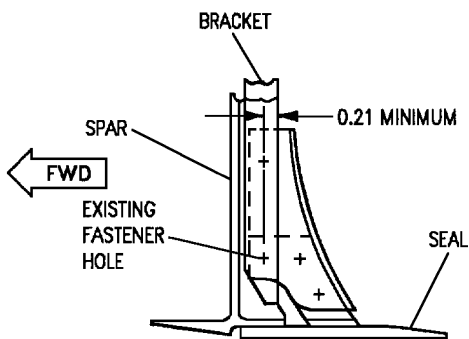
Figure 7. Seal, 74A190617, Repair (Sheet 3)



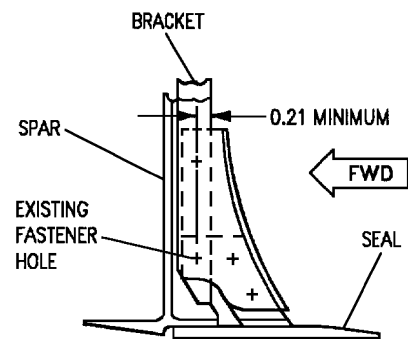
E
LOOKING INBOARD



F
LOOKING INBOARD



H
LOOKING INBOARD



G
LOOKING INBOARD

Figure 7. Seal, 74A190617, Repair (Sheet 4)

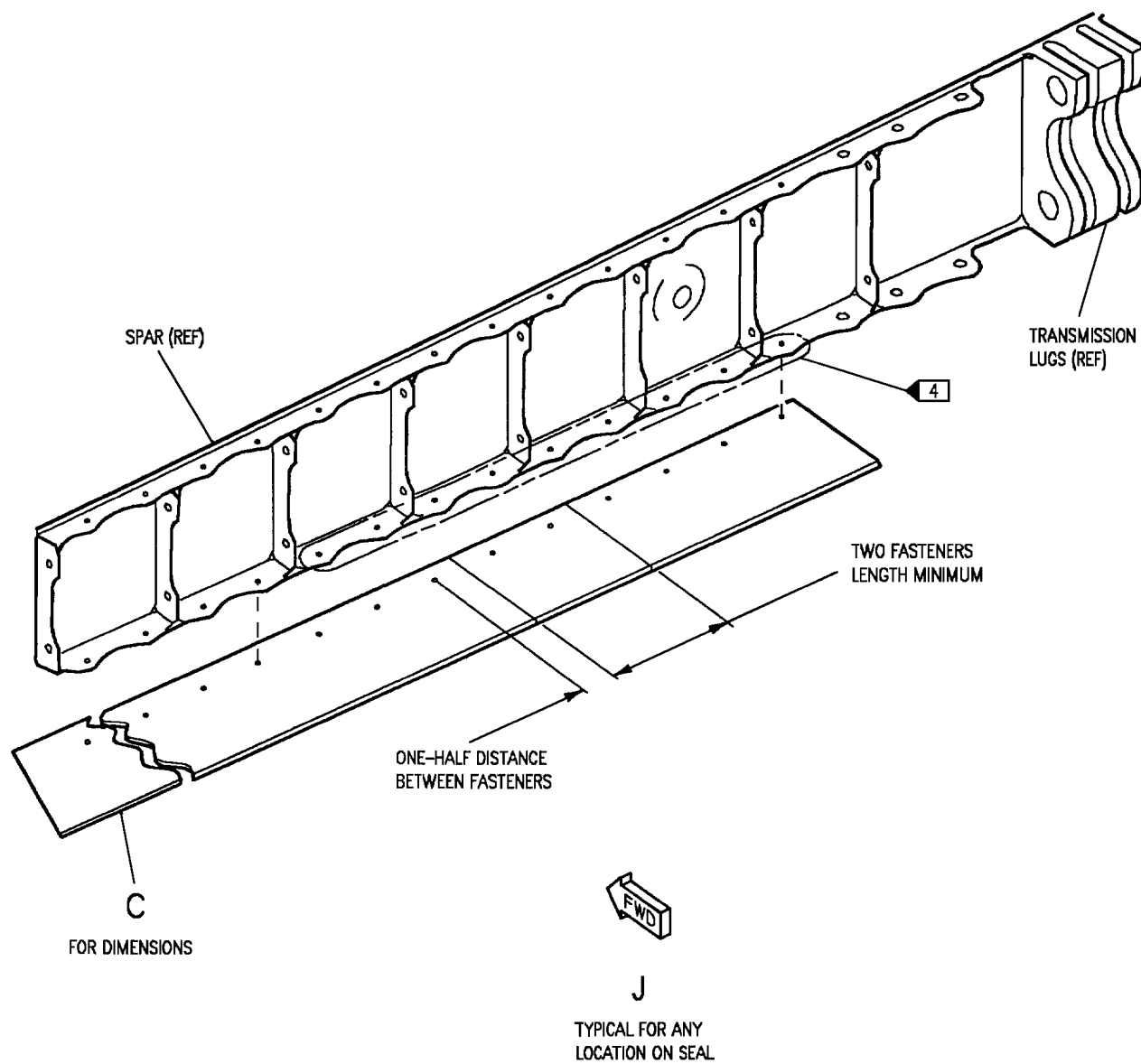


Figure 7. Seal, 74A190617, Repair (Sheet 5)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
1		Bracket	0.063 Sheet	7075-T76 Alclad
2		Tee	Make from 1MA160D03-10277 Extrusion	7075-T6511 Al Aly
3		Seal	0.080 Sheet	6AL-4V Ti Anl
LEGEND				
1 Typical installation for views E, F, and G. View H installed from inboard side of vertical stiffener.				
2 Length determined on installation.				
3 Hole diameter is 0.125 +0.003 -0.001.				
4 If any of these holes are drilled oversize by more than 0.0156, the holes must be cold worked.				
5 Use NAS1398C4A3, Blind Rivet at these holes for views G and H when standard rivet cannot be installed.				

Figure 7. Seal, 74A190617, Repair (Sheet 6)

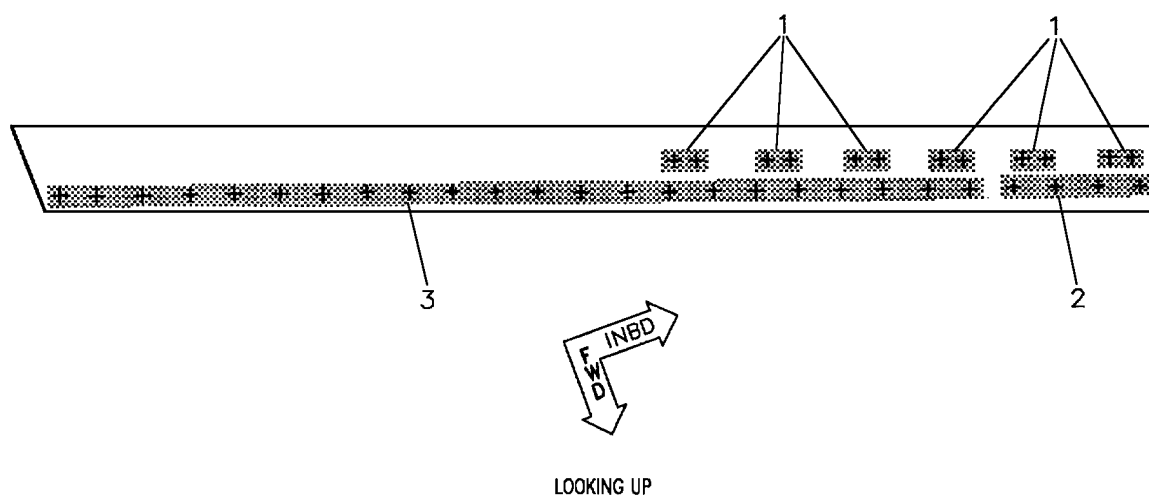


Figure 8. Seal, 74A190617, Fasteners (Sheet 1)












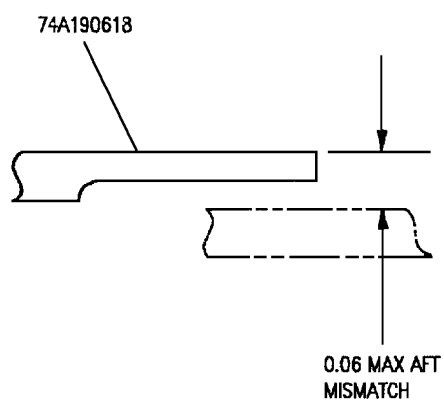
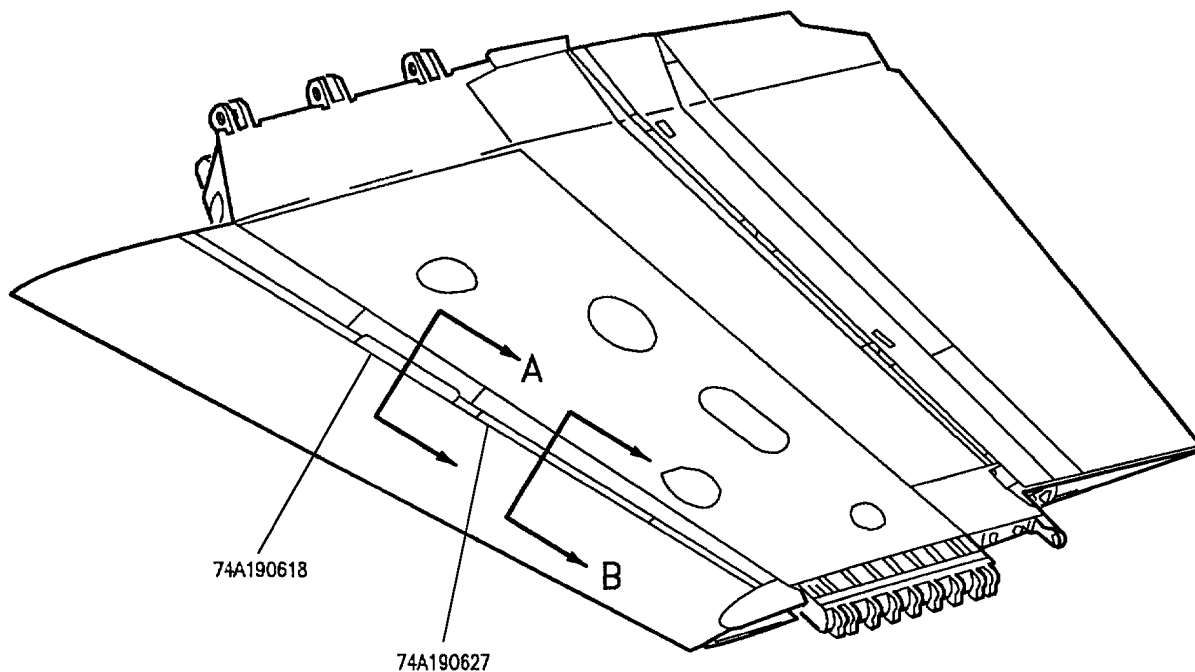
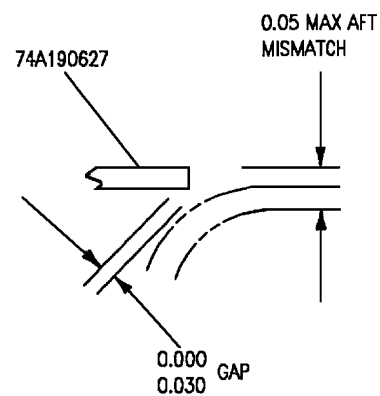
Idx No.	Eft		Nomenclature	Part Number
1		 	Rivet	NAS1097U4
2		 	Rivet	BRFS6T8
3		 	Rivet	BRFS5T7
<p style="text-align: center;">LEGEND</p> <p> Length determined on installation.</p> <p> Hole diameter is 0.125 +0.002 -0.001.</p> <p> Hole diameter is 0.187 +0.002 -0.001.</p> <p> Hole diameter is 0.156 +0.002 -0.001.</p> <p> Alternate replacement fasteners are: PLT1058 Blind Rivet, or HLT311 Pin and HL570 Collar.</p>				

Figure 8. Seal, 74A190617, Fasteners (Sheet 2)



A



B

Figure 9. Seal (74A190616, 74A190617, 74A190618, 74A190623 and 74A190627)
Gap and Mismatch (Sheet 1)

16010901

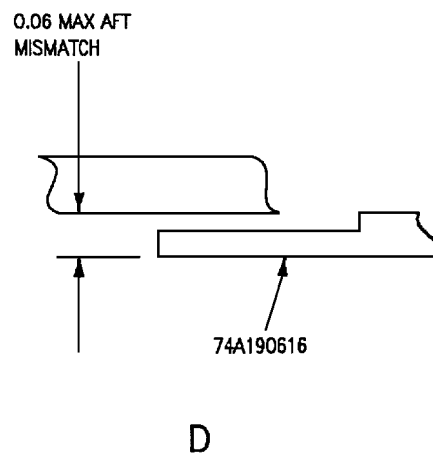
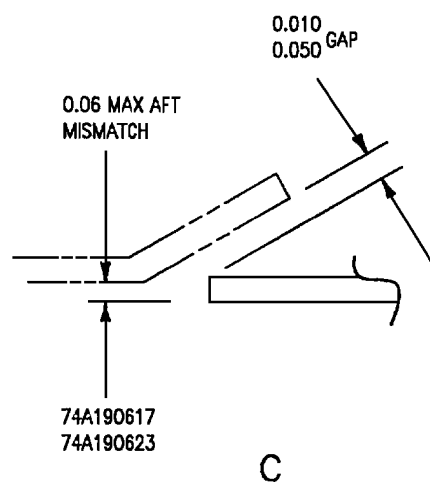
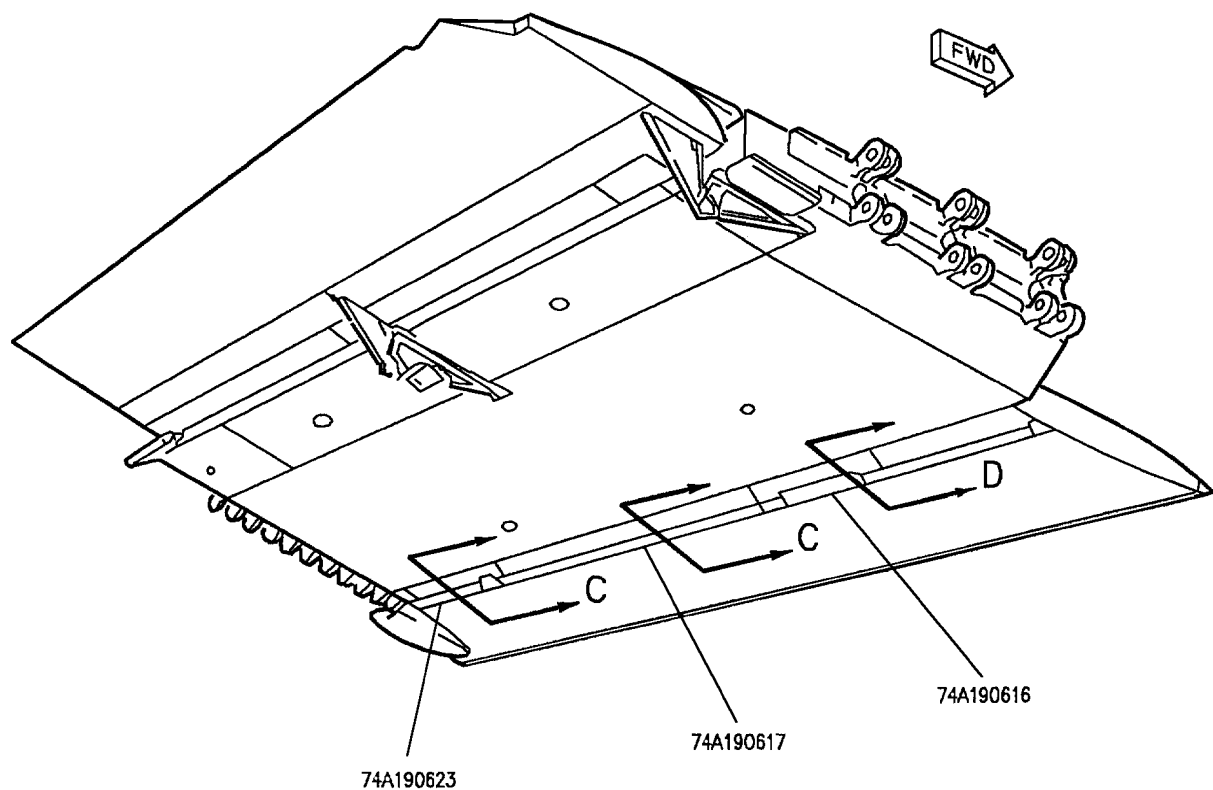


Figure 9. Seal (74A190616, 74A190617, 74A190618, 74A190623 and 74A190627)
Gap and Mismatch (Sheet 2)

16010902

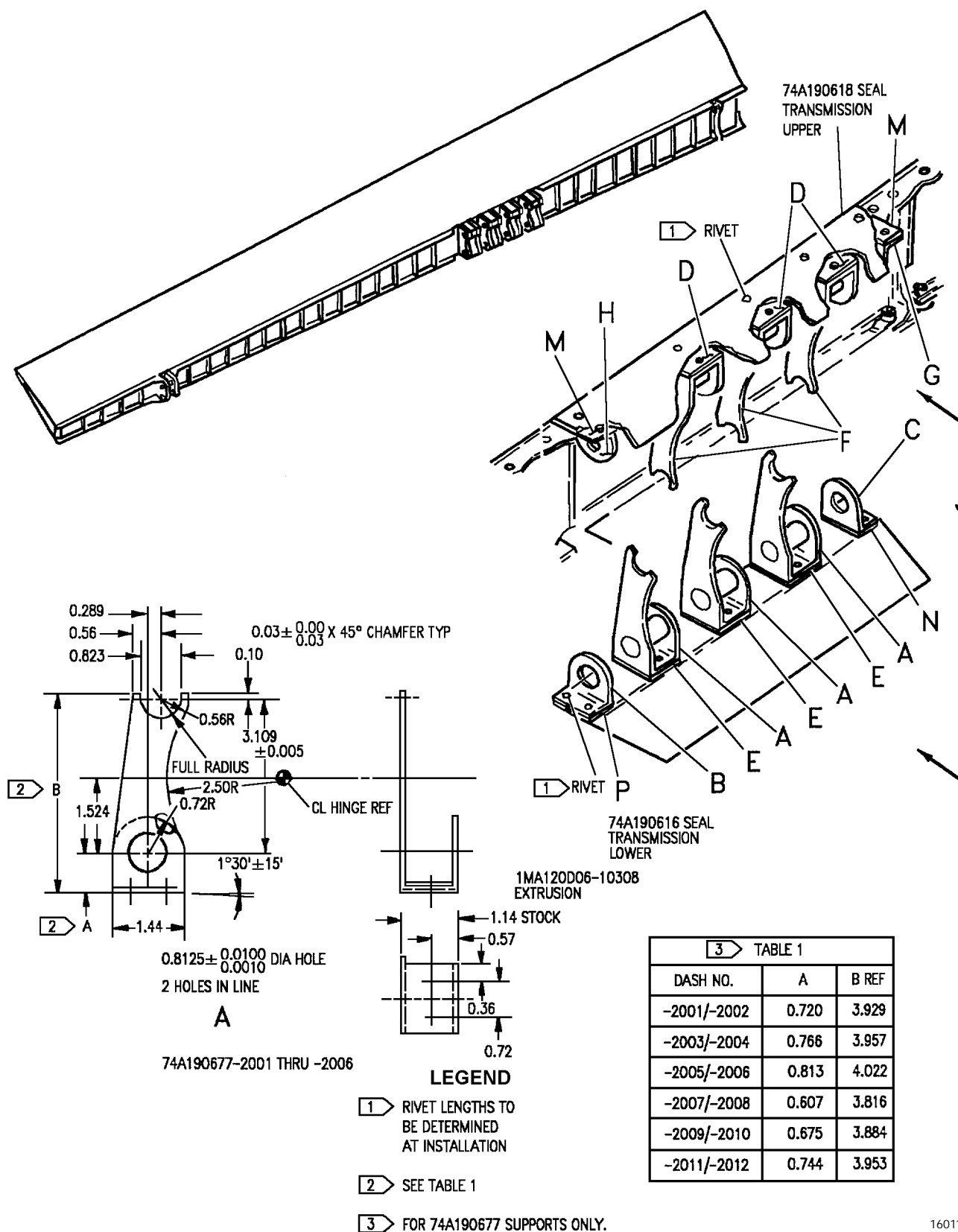
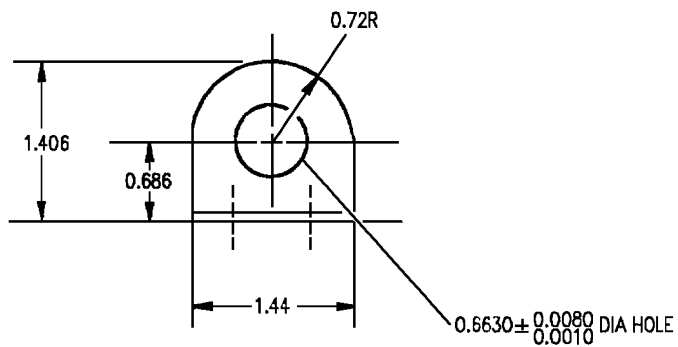
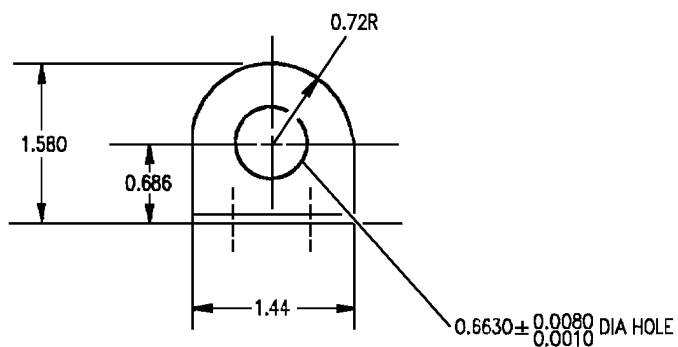
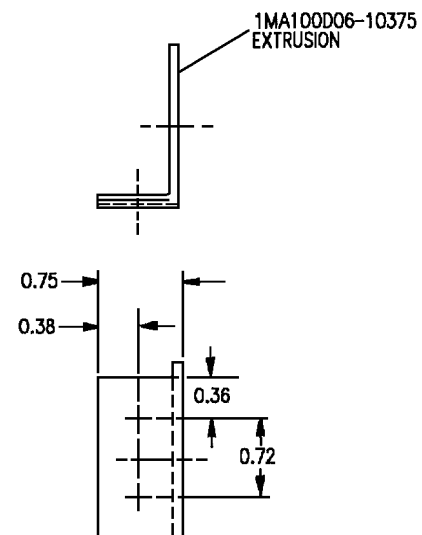


Figure 10. Transmission Seal Assembly, 74A190678, Replacement (Sheet 1)



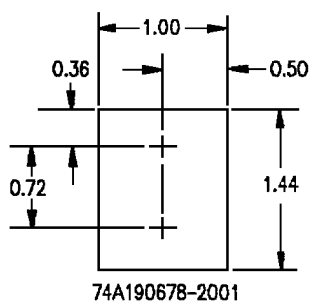
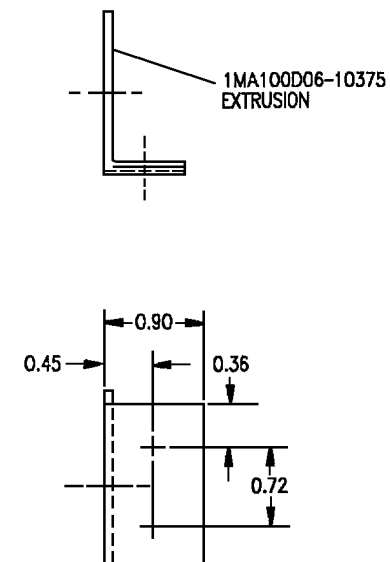
74A190677-2017,-2018

B



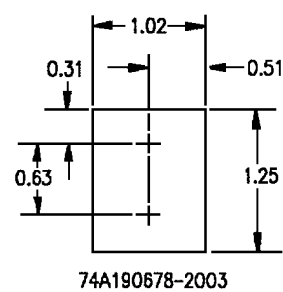
74A190677-2013,-2014

C



74A190678-2001

E

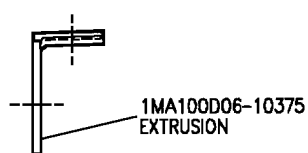
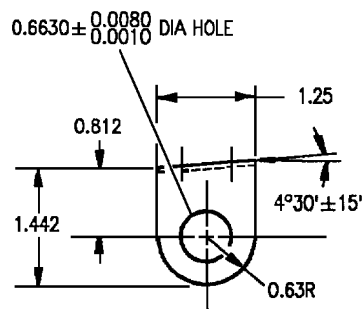
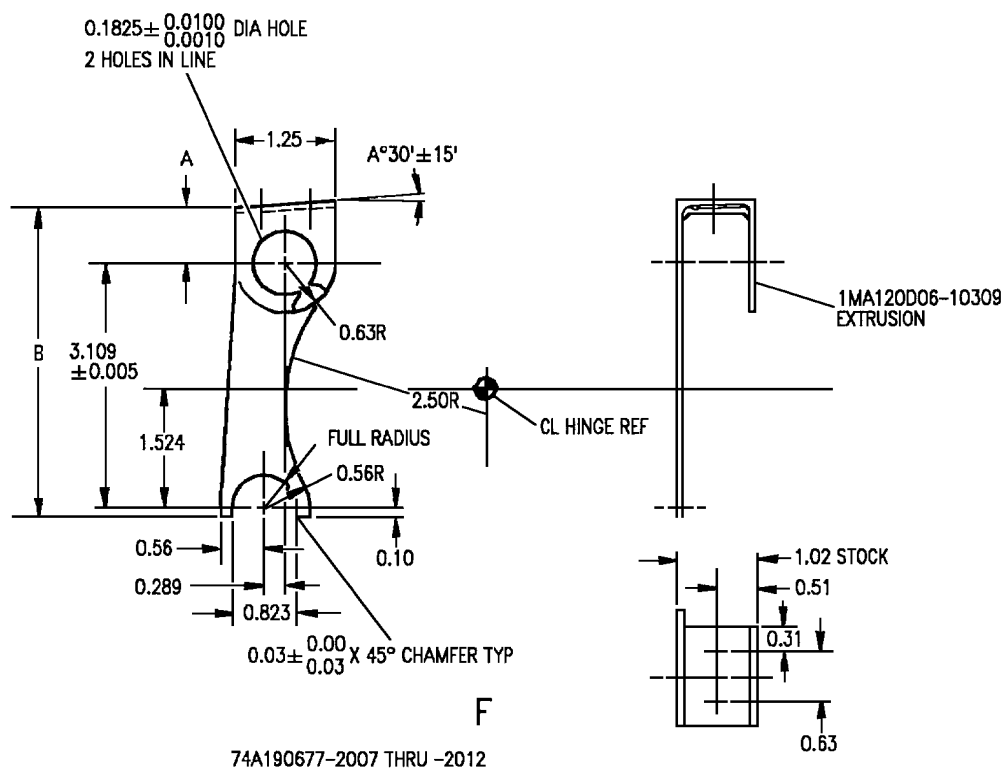


74A190678-2003

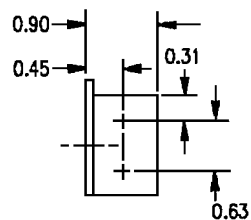
D

16011002

Figure 10. Transmission Seal Assembly, 74A190678, Replacement (Sheet 2)



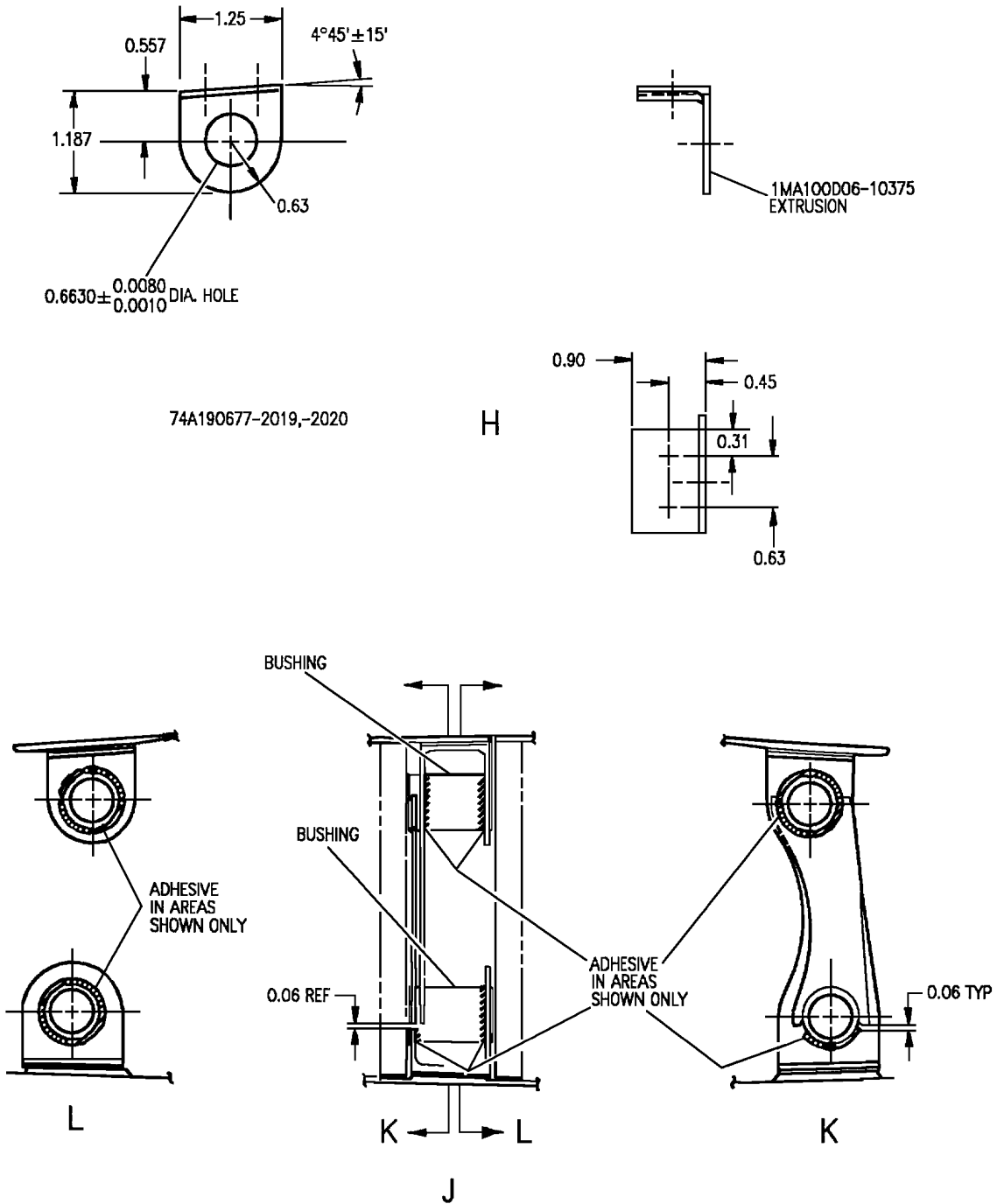
G



74A190677-2015, -2016

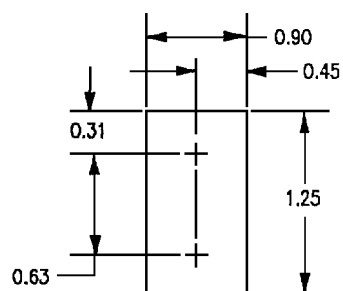
16011003

Figure 10. Transmission Seal Assembly, 74A190678, Replacement (Sheet 3)



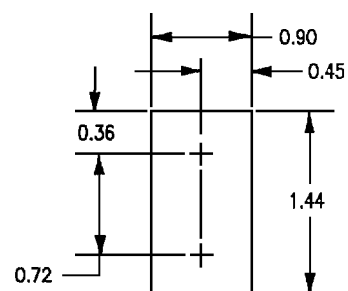
16011004

Figure 10. Transmission Seal Assembly, 74A190678, Replacement (Sheet 4)



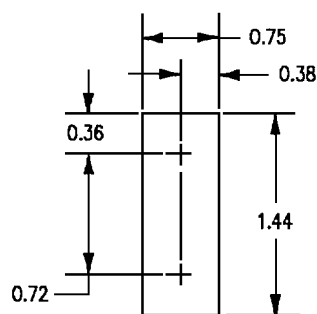
74A190678-2007

M



74A190678-2005

N



74A190678-2009

P

Figure 10. Transmission Seal Assembly, 74A190678, Replacement (Sheet 5)

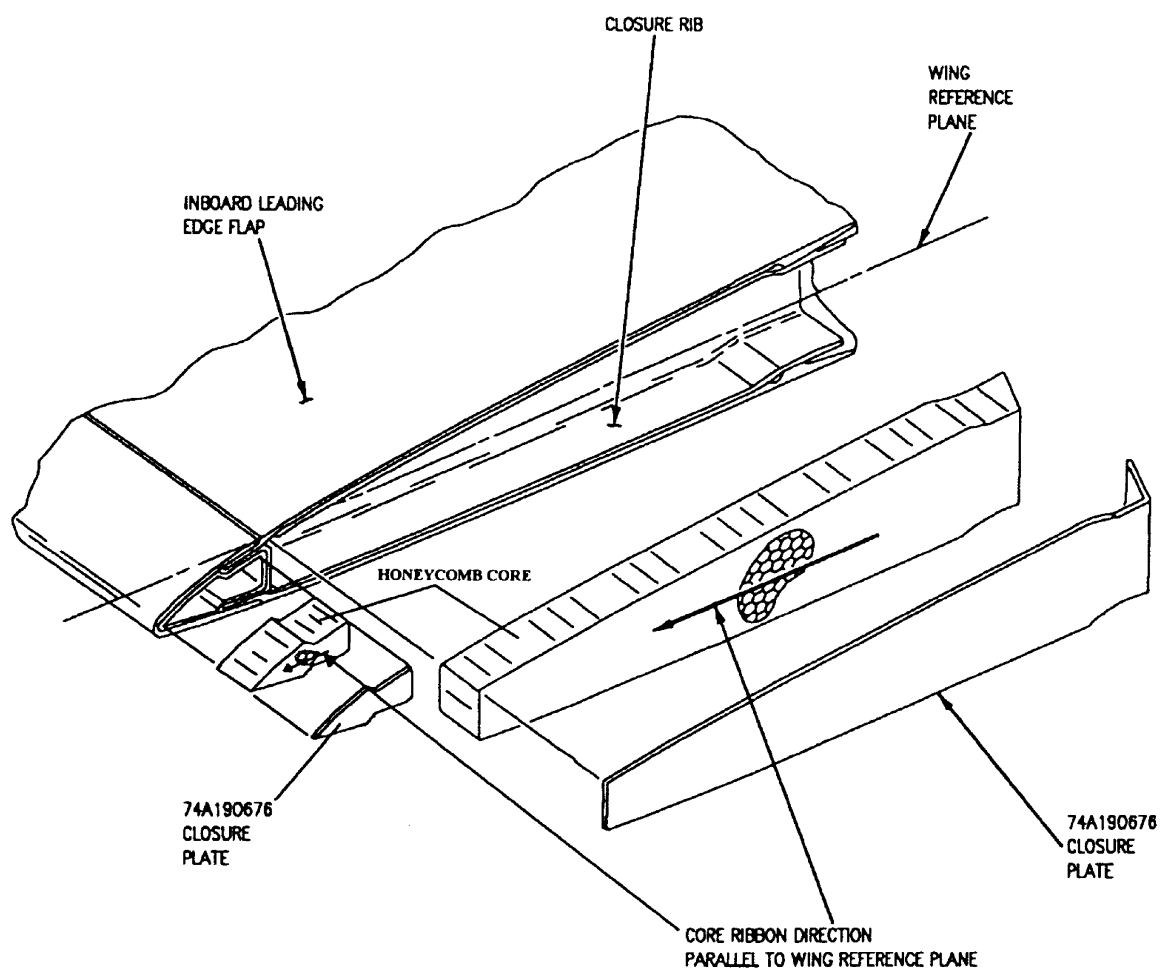
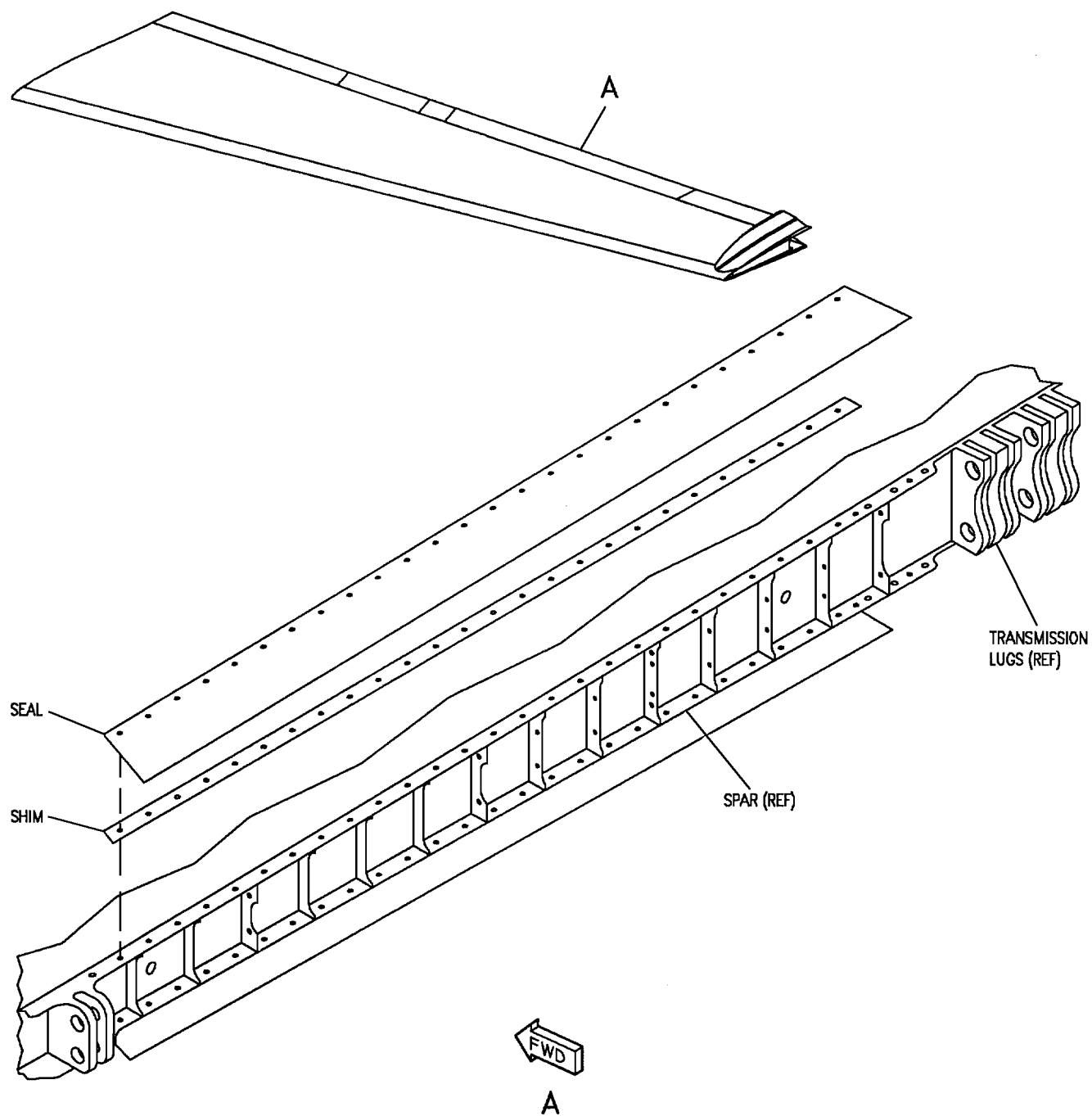


Figure 11. Outboard Closure Plate and Core, Replacement



TYPE	FASTENER	HOLE SIZE	COUNTERSINK
NOMINAL	PLT1058-5-4 (CAGE 98524)	0.1645 - 0.1675	0.251 - 0.261
FIRST OVERSIZE	PLT1064-5-4 (CAGE 92215)	0.1800 - 0.1830	0.251 - 0.261

Figure 12. Seal, 74A190627, Replacement

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

FAIRING - WING FOLD

EFFECTIVITY: 161353 THRU 161519

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Outboard Leading Edge Flap, Part No. 74A190202, 161353 THRU 161519	WP015 00
Inboard Leading Edge Flap, Part No. 74A190002, 161353 THRU 161519	WP016 00
Aircraft Corrosion Control	A1-F18AC-SRM-500
Inner and Outer Wing Finish System and Markings	WP027 00

Alphabetical Index

Subject	Page No.
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Repairable Damage	2
Repairs	2
Application of Repair Compound	3
Interim Leading Edge Flap Surface Preparation while Awaiting Replacement Fairing	3
Preparation of Repair Compound	3
Replacement	4
Bonding Procedure	4
Flap Surface Preparation After Receipt of Replacement Fairing	4
Removal of Damaged Fairing	4

Record of Applicable Technical Directives

None

Support Equipment Required

Nomenclature	Part Number or Type Designation
Canvas Band Clamp (or)	B2-20 (or)
Strapping, Non-Metallic	B2-30 (or)
(and Connectors)	PPP-S-760B
Scale, Balance, 0.003-	-
Ounce (or) 0.1 Gram	
Accuracy	

Support Equipment Required
(Continued)

Nomenclature	Part Number or Type Designation
Sealant Gun	Number 250

Materials Required**NOTE**

Alternate item specifications or part numbers are shown indented.

Nomenclature	Specification or Part Number
Adhesive	EPON 828
Aliphatic Polyurethane Enamel	MIL-P-83286
Apron, Utility	MIL-A-41829
Cartridges, Sealant Gun	250
Chemical Conversion Material	MIL-C-81706
Cleaning Compound	PR146 Blue
Cup, Paper, Wax-Free	UU-C-806, Type 1
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Mat, Abrasive	MIL-A-9962
Microballoons, Phenolic	BJO-0930
Nozzles, Sealant Gun	420, 430, 440, and 8643
Paper, Abrasive	A-A-1047, Grit 320-9X11
Polyamide Resin	Versamid 125
Primer Coating, Epoxy	MIL-P-23377
Remover, Paint	MIL-R-81294
Rymple Cloth	AMS-3819
Sealing Compound	MIL-S-83430
Tape, Pressure Sensitive	855-1.000
Tongue Depressor,	GG-D-226 226244,
Wooden Spatula	Type 1

1. DAMAGE EVALUATION. See figure 1.

2. The figure identifies how the fairing is positioned on the leading edge flaps. For material index (WP015 00 and WP016 00). The data shown can be used to analyze the damage.

3. **NEGLIGIBLE DAMAGE.** Negligible damage is damage that may be allowed to exist as is.

4. **REPAIRABLE DAMAGE.** Repairable damage is damage that can be repaired with no adverse affect on

structural integrity, flight characteristics, or safety of the aircraft.

NOTE

Repair to fairing is temporary and when time and materials are available the fairing must be replaced.

The leading edge flap must be removed if damage is to the lower fairing.

5. REPAIRS.

a. Mask fairing around damage area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination of alcohol, always pour alcohol into clean rymple cloth. Never dip rymple cloth into alcohol.

b. Clean damage area using clean rymple cloth moistened with isopropyl alcohol.

c. Scuff sand damage area with abrasive paper.

d. Remove sanding dust with vacuum.

e. Repeat cleaning of dust area using clean rymple cloth moistened with isopropyl alcohol, wipe surface with a dry rymple cloth before the solvent evaporates from surface.

6. PREPARATION OF REPAIR COMPOUND.



Epoxy Resin Adhesive

6



Polyimide Resin

7

NOTE

Mix only the amount of materials that will be used in 60 minutes.

a. Prepare epoxy resin base material in container by adding 70 parts by weight Epon 828 adhesive to 30 parts by weight Versamid 125 polyamide resin. Mix until a uniform creamy color is obtained.

b. Prepare compound by adding 50 parts by weight microballoons to 100 parts by weight epoxy resin base. Stir until a thick granular, putty-like, uniform compound is obtained. All microballoons must be wet with resin.

c. Fill cartridges.

7. APPLICATION OF REPAIR COMPOUND.



Epoxy Resin Adhesive

6



Polyimide Resin

7

a. Apply the repair compound to the cleaned fairing damage area with a spatula or sealant gun.

b. Fill cavity resulting from fairing damage and fair off compound to the original fairing shape.

c. Remove masking before curing repair compound.

d. Air cure at room temperature (65-100°F) for 12 hours.

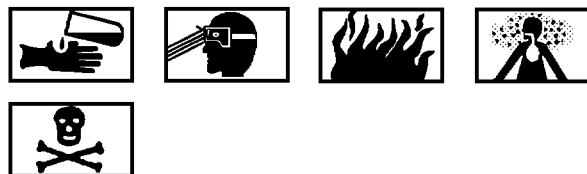
e. Wet sand repaired area on fairing until smooth and edges feathered with adjacent surfaces.

f. Refinish repaired areas (A1-F18AC-SRM-500, WP027 00).

8. INTERIM LEADING EDGE FLAP SURFACE PREPARATION WHILE AWAITING REPLACEMENT FAIRING.

Perform procedure if replacement fairing is unavailable and damaged fairing is still attached to leading edge flap.

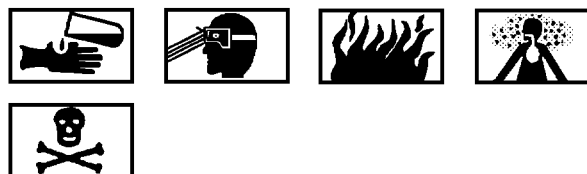
a. Remove damaged fairing and clean bonding surface (see paragraph titled Removal of Damaged Fairing, this WP.)



Chemical Conversion Coating

26

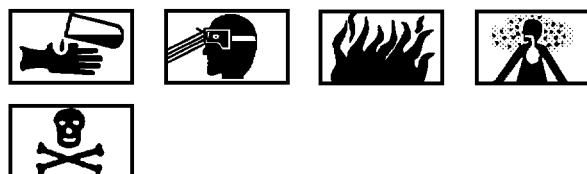
b. Chemical treat bare aluminum surface on flap that may have been exposed during removal of fairing using MIL-C-81706 chemical conversion coating (A1-F18AC-SRM-500, WP 011 00).



Epoxy Primer Coating

27

c. Prime chemically treated area using MIL-P-23377 primer (A1-F18AC-SRM-500, WP 011 00).



Aliphatic Polyurethane Enamel

28

d. Touch up paint primed surfaces using MIL-P-83286 aliphatic polyurethane enamel (A1-F18AC-SRM-500, WP 027 00).

9. REPLACEMENT.**10. REMOVAL OF DAMAGED FAIRING.**

a. Before removal of fairing, mark the location of fairing on leading edge flap.



Use extreme care when removing the fairing to avoid damaging the flaps.

b. Use scraper to cut sealant bond line.

c. Remove the fairing by using a peeling action. Start removal at forward tip or at aft corners and while peeling, cut sealant with scraper.

d. After removal of fairing, clean up bond surface.

(1) Cut off thicker sections of sealant with a scraper.



Isopropyl Alcohol

4



To avoid contamination of isopropyl alcohol, always pour isopropyl alcohol onto abrasive mat. Never dip abrasive mat into isopropyl alcohol.

(2) Rub off thin film of remaining sealant with abrasive mat and isopropyl alcohol.

11. FLAP SURFACE PREPARATION AFTER RECEIPT OF REPLACEMENT FAIRING. Perform procedure if leading edge flap mating bond surface is coated with paint.



Paint Remover

29

a. Chemical strip top coat on leading edge flap in area to be bonded using MIL-R-81294 (A1-F18AC-SRM-500, WP 007 00).

12. BONDING PROCEDURE.

Isopropyl Alcohol

4



To avoid contamination of alcohol, always pour alcohol into clean rymple cloth. Never dip rymple cloth into alcohol.

a. Thoroughly clean the bond area (flap and fairing) with clean rymple cloth moistened with isopropyl alcohol. Following each alcohol scrubbing, wipe with clean dry rymple cloth before the alcohol evaporates to remove and disperse contaminants.

b. Continue cleaning operation until an oil-free, water-break-free surface is obtained. During this cleaning operation, it is required that clean rymple cloths and clean isopropyl alcohol be used.

c. After cleaning procedure starts, do not touch surfaces to be bonded with bare hands. Operators shall wear clean white gloves while handling parts. If desired, rubber gloves may be worn underneath the cotton gloves.



Cleaning Compound

8

d. Apply thin coat of cleaning compound to faying surfaces of the fairing and metal structures which will come in contact when fairing is installed. Apply by wiping with rymple cloth and allow to air dry for a minimum of 1 hour at room temperature.



Sealing Compound

5

e. Apply a single heavy bead of sealing compound using a sealant gun to all areas of the fairing which

will contact the metal structure. For the larger corrugated area and the leading edge of the fairing, a 0.50 to 0.75 inch wide band of sealing compound. The outboard edge of the fairing, a 0.30 inch wide band of sealing compound. For the inboard edge of the fairing, a 0.10 inch wide band of sealing compound.

f. Align fairing to the marks on leading edge flap and install in such a manner as to minimize air entrapment. Start with the wider trailing edge and then work forward in a progressive manner to the forward end.



To avoid damage to leading edge flap and/or

fairing, do not overtighten clamping device.

g. Install the band clamp around leading edge flap and wing (chordwise). When band clamp is tightened, make certain there is sealing compound squeeze-out around the complete edge of fairing. In areas where there is no sealing compound squeeze-out, reinject sealing compound into lacking areas with clamp still tightened.

h. Allow sealing compound to cure at room temperature (65-100°F) for 18 hours with band clamp in place.

i. Refinish fairing areas (A1-F18AC-SRM-500, WP027 00).

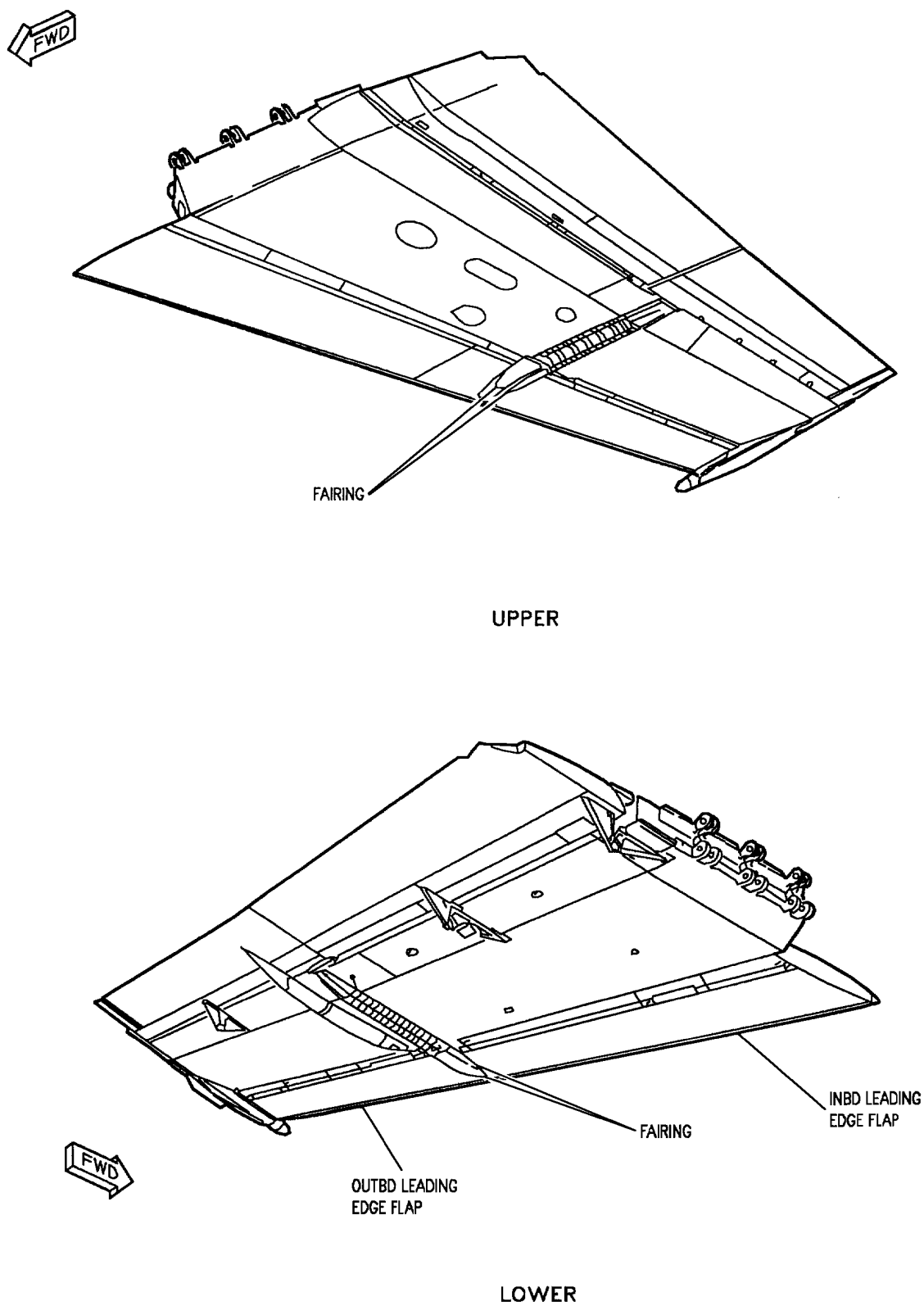


Figure 1. Wing Fold Fairing

ORGANIZATIONAL MAINTENANCE**STRUCTURE REPAIR****FAIRING - WING FOLD****EFFECTIVITY: 161520 AND UP**

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Outboard Leading Edge Flap, Part No. 74A190202, 161520 AND UP	WP015 01
Inboard Leading Edge Flap, Part No. 74A190002, 161520 AND UP	WP016 01
Aircraft Corrosion Control	A1-F18AC-SRM-500
Inner and Outer Wing Finish System and Markings	WP027 00
Structure Repair, General Information	A1-F18AC-SRM-200
Locating Blind Holes and Trim Lines	WP004 03
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00

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Record of Applicable Technical Directives

None

Support Equipment Required

Nomenclature	Part Number or Type Designation
Canvas Band Clamp (or) Strapping, Non-Metallic (and Connectors)	B2-20 (or) B2-30 (or) PPP-S-760B
Scale, Balance, 0.003- Ounce (or) 0.1 Gram Accuracy	-
Sealant Gun	Number 250
Torque Wrench, 0 to 25 Inch-Pounds	-

Materials Required

NOTE

Alternate item specifications or part numbers are shown indented.

Nomenclature	Specification or Part Number
Adhesive	EPON 828
Aircraft Marking Pencil	MIL-P-83953-2, Type 1, Class A or B, Red or Black
Aliphatic Polyurethane Enamel	MIL-P-83286
Apron, Utility	MIL-A-41829
Cartridges, Sealant Gun	250
Chemical Conversion Material	MIL-C-81706
Cleaning Compound	PR146 Blue
Cup, Paper, Wax-Free	UU-C-806, Type 1
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Mat, Abrasive	MIL-A-9962
Microballoons, Phenolic	BJO-0930
Nozzles, Sealant Gun	420, 430, 440, and 8643
Paper, Abrasive	A-A-1047, Grit 320-9X11
Polyamide Resin	Versamid 125
Primer Coating, Epoxy	MIL-P-23377
Rymple Cloth	AMS-3819
Sealing Compound	MIL-S-83430
Tape, Pressure Sensitive	855-1.000
Tongue Depressor, Wooden Spatula	GG-D-226 226244, Type 1

1. DAMAGE EVALUATION. See figure 1.

2. The figure identifies how the fairing is positioned on the leading edge flaps. For material index (WP015 01 and WP016 01). The data shown can be used to analyze the damage.

3. **NEGLIGIBLE DAMAGE.** Negligible damage is damage that may be allowed to exist as is.

4. **REPAIRABLE DAMAGE.** Repairable damage is damage that can be repaired with no adverse affect on structural integrity, flight characteristics, or safety of the aircraft.

NOTE

Repair to fairing is temporary and when time and materials are available the fairing must be replaced.

The leading edge flap must be removed if damage is to the lower fairing.

5. REPAIRS.

a. Mask fairing around damage area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination of alcohol, always pour alcohol into clean rymple cloth. Never dip rymple cloth into alcohol.

b. Clean damage area using clean rymple cloth moistened with isopropyl alcohol.

c. Scuff sand damage area with abrasive paper.

d. Remove sanding dust with vacuum.

e. Repeat cleaning of dust area using clean rymple cloth moistened with isopropyl alcohol, wipe surface with a dry rymple cloth before the solvent evaporates from surface.

6. PREPARATION OF REPAIR COMPOUND.



Epoxy Resin Adhesive

6



Polyamide Resin

7

NOTE

Mix only the amount of materials that will be used in 60 minutes.

a. Prepare epoxy resin base material in container by adding 70 parts by weight Epon 828 adhesive to 30 parts by weight Versamid 125 polyamide resin. Mix until a uniform creamy color is obtained.

b. Prepare compound by adding 50 parts by weight microballoons to 100 parts by weight epoxy resin base. Stir until a thick granular, putty-like, uniform compound is obtained. All microballoons must be wet with resin.

c. Fill cartridges.

7. APPLICATION OF REPAIR COMPOUND.



Epoxy Resin Adhesive

6



Polyamide Resin

7

a. Apply the repair compound to the cleaned fair-

ing damage area with a spatula or sealant gun.

b. Fill cavity resulting from fairing damage and fair off compound to the original fairing shape.

c. Remove masking prior to curing repair compound.

d. Air cure at room temperature (65-100°F) for 12 hours.

e. Wet sand repaired area on fairing until smooth and edges are feathered with adjacent surfaces.

f. Refinish any repaired areas (A1-F18AC-SRM-500, WP027 00).

8. INTERIM LEADING EDGE FLAP (LEF) SURFACE PREPARATION WHILE AWAITING REPLACEMENT FAIRING. Perform procedure if replacement fairing is unavailable and damaged fairing is still attached to leading edge flap.

a. Remove damaged fairing and clean bonding surface (see paragraph titled Removal of Damaged Fairing). Retain HL10V6-38 pin (if available) for reinstallation with replacement fairing.



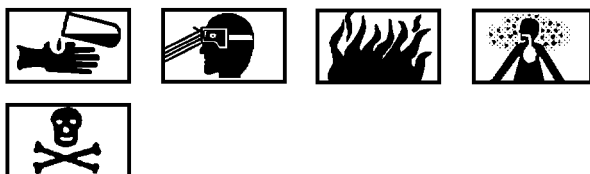
Do not fill fastener hole with sealant as this may cause damage to the leading edge flap core during sealant removal.



Sealing Compound

5

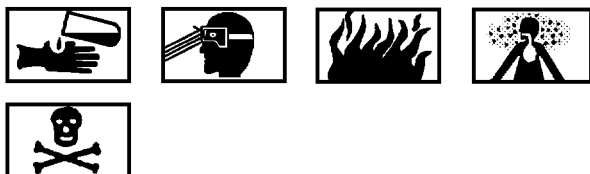
b. Apply 1/2 inch diameter aluminum tape to cover open fastener hole(s) resulting from removal of P/N HL10V6-38 pin. Seal off 2 inch diameter around fastener hole(s) using MIL-S-83430 sealant (A1-F18AC-SRM-200, WP011 00).



Chemical Conversion Coating

26

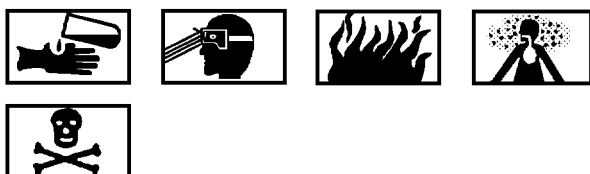
c. Chemical treat bare aluminum surface on flap that may have been exposed during removal of fairing using MIL-C-81706 chemical conversion coating (A1-F18AC-SRM-500, WP 011 00).



Epoxy Primer Coating

27

d. Prime chemically treated area using MIL-P-23377 primer (A1-F18AC-SRM-500, WP 011 00).



Aliphatic Polyurethane Enamel

28

e. Touch up paint primed surfaces using MIL-P-83286 aliphatic polyurethane enamel (A1-F18AC-SRM-500, WP 027 00).

9. REPLACEMENT.

10. REMOVAL OF DAMAGED FAIRING.

a. Before removal of fairing, mark the location of the fairing on leading edge flap.

b. Make sure all adhesive filler is removed from fairing that will be bonding to underlying structure.



Use extreme care when removing the fairing to avoid damaging the flaps.

Be careful not to enlarge holes when drilling out rivets.

c. Remove rivets attaching fairing to leading edge flap.

d. Use scraper to cut sealant bond line.

e. Remove the fairing by using a peeling action. Start removal at forward tip or at aft corners and while peeling, cut sealant with scraper.

f. After removal of fairing, clean up bond surface.

(1) Cut off thicker sections of sealant with a scraper.



Isopropyl Alcohol

4



To avoid contamination always pour isopropyl alcohol onto abrasive mat. Never dip abrasive mat into isopropyl alcohol.

(2) Rub off thin film of remaining sealant with abrasive mat and isopropyl alcohol.

11. FLAP SURFACE PREPARATION AFTER RECEIPT OF REPLACEMENT FAIRING Perform procedure if LEF mating bond surface is coated with paint.

- a. Remove sealant and tape from LEF hole(s).



Paint Remover

29

b. Mask off LEF fastener hole(s) to ensure paint remover does not penetrate and cause damage to LEF core. Chemical strip top coat on LEF in area to be bonded using MIL-R-81294 paint remover (A1-F18AC-SRM-500, WP007 00).

12. INSTALLATION AND BONDING PROCEDURE.



Be careful when removing epoxy filler from fairing. Damage to fairing inner mold line may occur.

a. Inspect replacement fairing. If epoxy filler is located in forward end of fairing, remove it. Some spared fairings may have epoxy filler installed. The use of epoxy filler has been deleted from production fairings.

b. Mate drill rivet holes (details A and B). For locating blind holes (A1-F18AC-SRM-200, WP004 03).



Isopropyl Alcohol

4



To avoid contamination of alcohol, always pour alcohol into clean rymple cloth. Never dip rymple cloth into alcohol.

c. Thoroughly clean the bond area (flap and fairing) with clean rymple cloth moistened with isopropyl

alcohol. Following each alcohol scrubbing, wipe with clean dry rymple cloth before the alcohol evaporates to remove and disperse contaminants.

d. Continue cleaning operation until an oil-free, water-break-free surface is obtained. During this cleaning operation, it is required that clean rymple cloths and clean isopropyl alcohol be used.

e. After cleaning procedure starts, do not touch surfaces to be bonded with bare hands. Operators shall wear clean gloves while handling parts. If desired, rubber gloves may be worn underneath the cotton gloves.



Cleaning Compound

8

f. Apply thin coat of cleaning compound to faying surfaces of the fairing and metal structures which will come in contact when fairing is installed. Apply by wiping with rymple cloth and allow to air dry for a minimum of 1 hour at room temperature.



Sealing Compound

5

g. Select correct nozzle, apply a single heavy bead of sealing compound using a sealing compound gun to all areas of the fairing which will contact the metal structure. For the larger corrugated area and the leading edge of the fairing, a 0.25 inch wide band of sealing compound. The outboard edge of the fairing, a 0.25 inch wide band of sealing compound. For the inboard edge of the fairing, a 0.25 inch wide band of sealing compound. See details D and G.

h. Align fairing to the marks on leading edge flap and install in such a manner as to minimize air entrapment. Start with the wider trailing edge and then work forward in a progressive manner to the forward end.

i. Coat rivets with sealing compound and install while sealing compound is wet (A1-F18AC-SRM-200, WP011 00).

j. Apply sealing compound, MIL-S-83430, CLB-1/2, to forward and inboard side of replacement fairing, see detail H. Fair mold line of fairing to mold

line of flap. Refer to Sealant Preparation and Application (A1-F18AC-SRM-200, WP011 00).

k. Fill cavity around rivet with sealing compound (detail C).



To avoid damage to leading edge flap and/or fairing, do not over tighten clamping device.

l. Install the band clamp around leading edge flap

and wing (chordwise). When band clamp is tightened, make certain there is sealing compound squeeze out around the entire edge of the fairing. In areas where there is no sealing compound squeeze out, reinject sealing compound into lacking areas with clamp still tightened.

m. Allow sealing compound to cure at room temperature (65-100°F) for 18 hours with band clamp in place.

n. Refinish fairing areas (A1-F18AC-SRM-500, WP027 00).

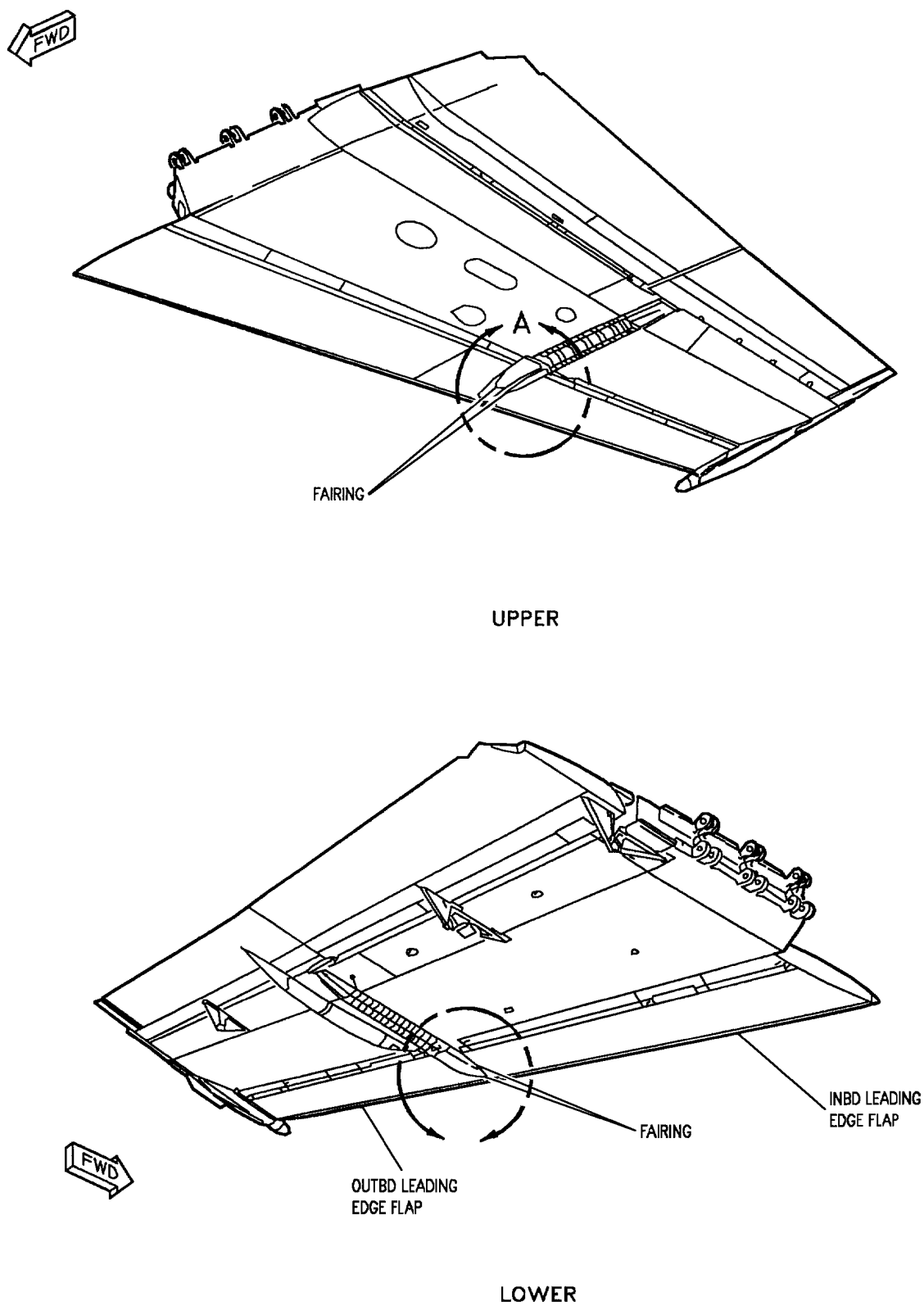
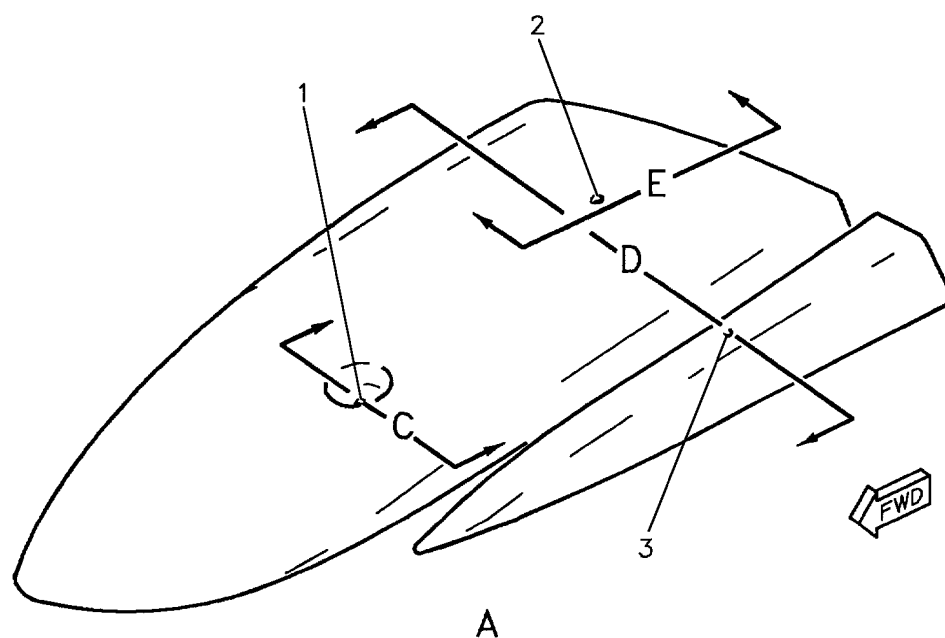
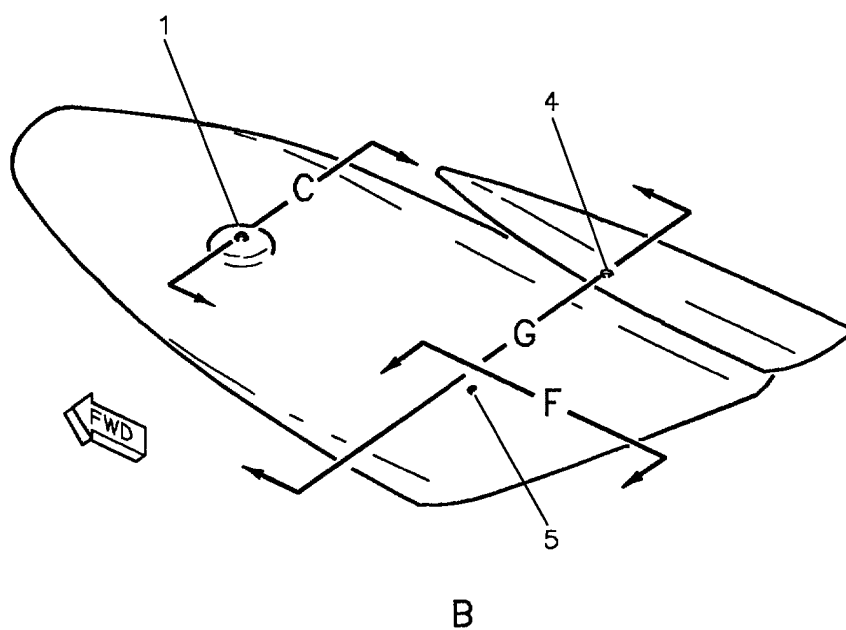


Figure 1. Wing Fold Fairing (Sheet 1)



UPPER FAIRING, 74A190673



LOWER FAIRING, 74A190674

Figure 1. Wing Fold Fairing (Sheet 2)

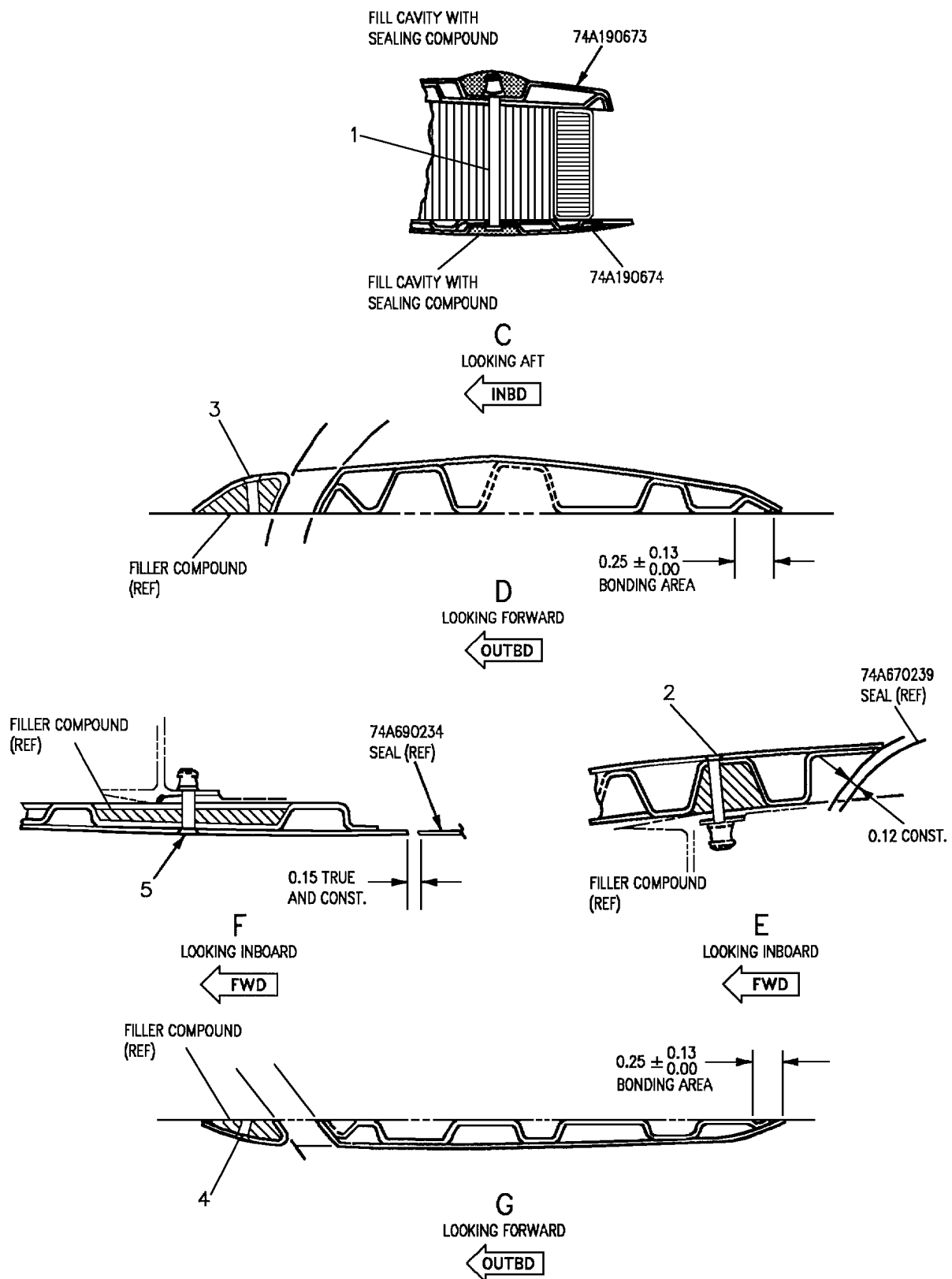


Figure 1. Wing Fold Fairing (Sheet 3)

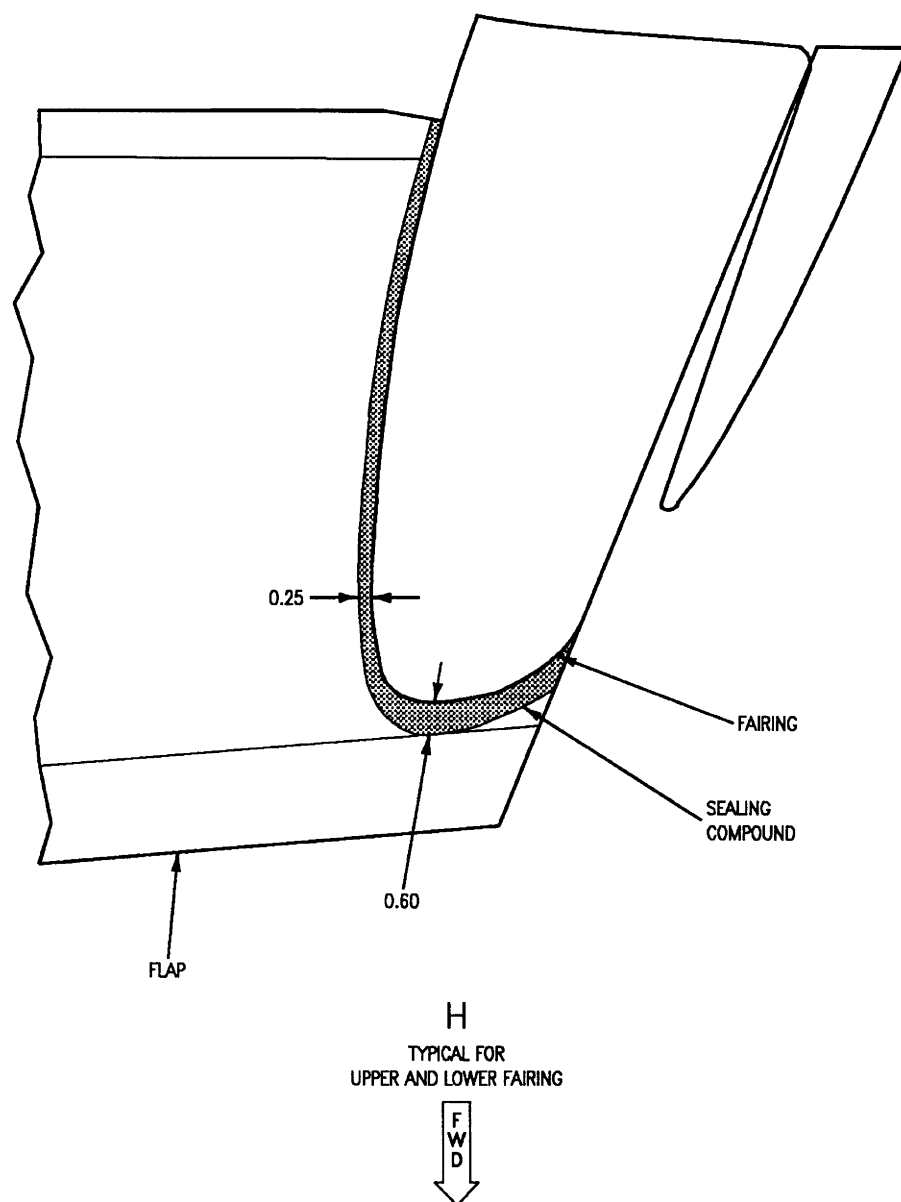


Figure 1. Wing Fold Fairing (Sheet 4)

Idx No.	Eft		Nomenclature	Part Number
1	<div>7</div> <div>8</div>	<div>2</div> <div>4</div> <div>2</div> <div>4</div> <div>5</div> <div>6</div>	Pin Nut Washer Pin Nut Washer Washer	HL10V6-38 TLN1023CD3-3N TLN1023CD3L3W HL10V6-38 TLN1023CD3L3N 4M36-01016 4M36-01031
2	<div>7</div> <div>8</div>	<div>1</div> <div>4</div> <div>1</div>	Pin Nut Washer Pin Nut	HLT313DL-5-20 NAS1291C08M AN960JD8 HL611-5-14 NAS1291C08M
3	<div>9</div> <div>10</div>	<div>3</div> <div>3</div>	Rivet Rivet	NAS1399D5A8 NAS1398D5A7
4	<div>9</div> <div>10</div>	<div>3</div> <div>3</div>	Rivet Rivet	NAS1399D5A5 NAS1398D5A4
5	<div>7</div> <div>8</div>	<div>1</div> <div>4</div> <div>1</div> <div>4</div>	Pin Nut Washer Pin Nut Washer	HLT313DL-5-12 NAS1291C08M AN960JD8 HLT313DL-5-9 NAS1291C08M AN960JD8

LEGEND

- 1

 Hole diameter is 0.1635 +0.0022 -0.0000.

2

 Hole diameter is 0.1895 +0.0022 -0.0000.

3

 Hole diameter is 0.1610 +0.0030 -0.0010.

4

 Torque nut 10 to 15 inch-pounds.

5

 One required; under head.

6

 One required; under nut.

7

 Left side: 161520 THRU 162866, 162868 THRU 162869, 162889, 162898, 162901, 163128, 163139;
Right side: 161520 THRU 162868, 162898, 162901, 163128.

8

 Left side: 162867, 162870 THRU 162888, 162890 THRU 162897, 162899 THRU 162900,
162902 THRU 163127, 163129 THRU 163138, 163140 AND UP.
Right side 162869 THRU 162897, 162899 THRU 162900, 162902 THRU 163127, 163129 AND UP.

9

 Left side: 161520 THRU 162847, 162863, 162893, 163134;
Right side: 161520 THRU 162847, 162863, 162890 THRU 162891, 162898.

10

 Left side: 162848 THRU 162862, 162864 THRU 162892, 162894 THRU 163133, 163135 AND UP.
Right side: 162848 THRU 162862, 162864 THRU 162889, 162892 THRU 162897, 162899 AND UP.

Figure 1. Wing Fold Fairing (Sheet 5)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

INBOARD LEADING EDGE FLAP

FREE PLAY INSPECTION AND WEAR TOLERANCES

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Inboard Leading Edge Flap, Part No. 74A190002, 161353 THRU 161519	WP016 00
Inboard Leading Edge Flap, Part No. 74A190002, 161520 AND UP	WP016 01
Aircraft Corrosion Control	A1-F18AC-SRM-500
Inner and Outer Wing Finish System and Markings	WP027 00
Forward Center Fuselage Finish System and Markings	WP030 00
Integrated Flight Controls	A1-F18AC-570-300
Rig Mode and Memory Inspect, Effectivity: 161520 AND UP; ALSO	
161353 THRU 161519 AFTER F18 AFC 27	WP011 00
Inboard Flap (84MPU535 or 84MPV536)	WP028 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Line Maintenance Procedures	A1-F18AC-LMM-000
Plane Captain Manual	A1-F18AC-PCM-000
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00

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Free Play Inspection For 161520 AND UP	4
Inspection and Correction	5
Wear Tolerances	5

Record of Applicable Technical Directives

None

1. DESCRIPTION.

2. Wear limits established for the flap allow a maximum free play of 0.600 inch. The paragraphs below contain procedures for the free play inspection, inspection and correction for failed freeplay inspection, wear tolerances, support equipment and materials required.

3. FREE PLAY INSPECTION FOR 161353 THRU 161519. See figure 1. Do steps below:

Support Equipment Required

Nomenclature	Part Number or Type Designation
Aluminum Arm Assembly	Fabricate
Aluminum Plate, 4X4X 1/2, with a Drilled and Tapped Hole of 5/16-Inch No. 18 Thread in Center of Plate	Fabricate
Dial Indicator Kit (0.001 Inch Graduations, Minimum)	196 (Starrett or Equivalent)
External Electrical Power Source	-
External Hydraulic Power Source	-
Rubber Pad, 4X4X1/8	Fabricate
Spring Resiliency Tester	DPPH150
Tripod Jack, 20 Ton (T20-3FH)	782D1100

Materials Required

Nomenclature	Specification or Part Number
Aircraft Marking Pencil, Black	MIL-P-83953-2, Type 1, Class A
Isopropyl Alcohol	TT-I-735, Grade 1
Rymple Cloth	AMS-3819
Tape, Double-Coated	A-A-180, Type 2, Grade B

a. Make sure flap control surface lock is not installed (A1-F18AC-PCM-000).

b. Make sure horizontal stabilator position support is not installed (A1-F18AC-PCM-000).

c. Make sure doors 83L, 83R, 84L, and 84R and radome are closed (A1-F18AC-LMM-010).

d. On Digital Display Indicator ID-2150/ASM-612 in nose wheelwell, observe WPN SYS FAIL indicator.

e. Apply electrical power (A1-F18AC-LMM-000).

f. On GND PWR control panel assembly, set 1 switch to A ON and 2 switch to B ON.

g. Set left and right Digital Display Indicator (DDI) IP-1317/A power switch to DAY or NIGHT. Allow 2 minute warmup. Adjust BRT and CONT controls for best display.

h. Press right DDI MENU pushbutton switch.

i. Press right DDI BIT pushbutton switch.

j. On LH vertical console control panel, set FLAP switch to AUTO.

k. On FCS Control Panel C-10406/ASW-44, set the GAIN switch to NORM.

l. On MAP GAIN control panel assembly, set SPIN switch to NORM.

m. On GND PWR control panel assembly, set 4 switch to B ON.

n. Wait 20 seconds for BIT to initialize.

o. Simultaneously press the below switches:

(1) On FCS Control Panel C-10406/ASW-44, press RESET switch.

(2) On Control Stick Sensor DT-601/ASW-44, press the autopilot/nosewheel steering disengage switch (paddle switch).

WARNING

Control surfaces move during initiated BIT with hydraulic power applied. To prevent personnel injury or equipment damage, be sure personnel and equipment are kept clear of control surfaces.

p. Apply hydraulic power to systems 1 and 2 (A1-F18AC-LMM-000).

q. On FCS Control Panel C-10460/ASW-44, press RESET switch.

r. On FCS Control Panel C-10460/ASW-44, press T/O TRIM PUSH switch.

s. Fabricate aluminum arm assembly. See details G through M.



Isopropyl Alcohol



4



To avoid contamination of isopropyl alcohol always pour into cleaning materials. Never dip cleaning materials into isopropyl alcohol.

t. Clean back side of dial indicator mount and area of center fuselage where dial indicator is to be mounted with a clean cloth saturated with isopropyl alcohol. Wipe area clean with a clean, dry cloth before isopropyl alcohol dries.

u. Position dial indicator assembly on center fuselage and mark area for position with pencil.

v. Apply tape to dial indicator mount.

w. Attach dial indicator mount to center fuselage.

x. Attach dial indicator assembly to dial indicator mount and position at correct location, view A.

y. Adjust dial indicator assembly with dial indicator plunger resting on upper surface of inboard leading edge flap. Adjust dial indicator to 0.



To prevent damage to aircraft, make sure that there is enough clearance between jack and flap before moving jack under flap, and do not raise jack higher than required to locate the arm in horizontal position.

z. Position jack and arm under flap raise jack until rubber pad on arm contacts flap and arm is horizontal. Mark location of rubber pad with pencil. Seat jack by placing blocks under jack foot pads.

aa. Thread spring resiliency tester into aluminum plate. Place aluminum plate on upper surface of inboard leading edge flap at correct location and apply a 50 pound down load.

ab. Readjust dial indicator to 0 with load applied.

ac. Attach spring resiliency tester to arm and pull down with a 15 pound load.

ad. Record total deflection from dial indicator with 15 pound load applied.

ae. Total deflection should not exceed 0.558 inch. A total deflection that exceeds 0.558 inch requires inspection and correction per Inspection and Correction, this WP.

af. Remove dial indicator assembly from dial indicator mount.

ag. Remove dial indicator mount from aircraft.

ah. Lower jack and arm, remove arm and blocks and move jack out from under aircraft.

ai. Remove electrical and hydraulic power (A1-F18AC-LMM-000).

aj. Remove tape from dial indicator mount or center fuselage.

ak. Remove aluminum plate from spring resiliency tester.

al. Refinish surface (A1-F18AC-SRM-500, WP027 00 and WP030 00).

4. FREE PLAY INSPECTION FOR 161520 AND UP. See figure 1. Do steps below:



Support Equipment Required

Nomenclature	Part Number or Type Designation
Aluminum Arm Assembly	Fabricate
Aluminum Plate, 4X4X 1/2, with a Drilled and Tapped Hole of 5/16-Inch No. 18 Thread in Center of Plate	Fabricate
Dial Indicator Kit (0.001 Inch Graduations, Minimum)	196 (Starrett or Equivalent)
External Electrical Power Source	-
External Hydraulic Power Source	-
Rubber Pad, 4X4X1/8	Fabricate
Spring Resiliency Tester	DPPH150
Tripod Jack, 20 Ton (T20-3FH)	782D1100

Materials Required

Nomenclature	Specification or Part Number
Aircraft Marking Pencil, Black	MIL-P-83953-2, Type 1, Class A
Isopropyl Alcohol	TT-I-735, Grade 1
Rymple Cloth	AMS-3819
Tape, Double-Coated	A-A-180, Type 2, Grade B

a. Do rig mode setup (A1-F18AC-570-300, WP011 01).

b. On LH vertical console control panel, set FLAP switch to HALF.

c. Fabricate aluminum arm assembly. See details G through M.



Isopropyl Alcohol



4

To avoid contamination, always pour isopropyl alcohol onto cleaning cloth. Never dip cleaning cloth into isopropyl alcohol.

d. Clean backside of dial indicator mount and area of center fuselage where dial indicator is to be mounted with a clean cloth saturated with isopropyl alcohol. Wipe area clean with a clean, dry cloth before isopropyl alcohol dries.

e. Position dial indicator assembly on center fuselage and mark area for position with pencil.

f. Apply tape to dial indicator mount.

g. Attach dial indicator mount to center fuselage.

h. Attach dial indicator assembly to dial indicator mount and position at correct location, view A.

i. Adjust dial indicator assembly with dial indicator plunger resting on upper surface of inboard leading edge flap. Adjust dial indicator to 0.



To prevent damage to aircraft, make sure that there is enough clearance between jack and flap before moving jack under flap, and do not raise jack higher than required to locate the arm in horizontal position.

j. Position jack and arm under flap, raise jack until rubber pad on arm contacts flap and arm is horizontal. Mark location of rubber pad with pencil. Seat jack by placing blocks under jack foot pads.

k. Thread spring resiliency tester into fabricated aluminum plate. Place aluminum plate

on upper surface of inboard leading edge flap at correct location and apply a 50 pound down load.

l. Readjust dial indicator to 0 with load applied.

m. Attach spring resiliency tester to arm and pull down with a 15 pound load.

n. Record total deflection from dial indicator with 15 pound load applied.

o. Total deflection should not exceed 0.558 inch. A total deflection that exceeds 0.558 inch requires inspection and correction per Inspection and Correction, this WP.

p. Remove dial indicator assembly from dial indicator mount.

q. Remove dial indicator mount from aircraft.

r. Lower jack and arm, remove arm and blocks and move jack out from under aircraft.

s. Set flap switch to AUTO.

t. Do rig mode shutdown (A1-F18AC-570-300, WP011 01).

u. Remove tape from dial indicator mount or center fuselage.

v. Remove aluminum plate from spring resiliency tester.

w. Refinish surface (A1-F18AC-SRM-500, WP027 00 and WP030 00).

5. INSPECTION AND CORRECTION. If the inboard leading edge flap has failed the freeplay inspection, the joints should be inspected and corrected as detailed below.

a. Remove inboard leading edge flap (A1-F18AC-570-300, WP028 00).

b. Disassemble the idler hinge and transmission joints. Do not press out bushings or remove staked bearings.

c. Visually inspect for any broken or yielded components. Measure all replaceable parts (items 2, 5, 11, 12, 16, 17, 21, 22, 34 and 35, figure 2) and compare to allowable wear tolerances.

d. Replace all replaceable items that exceed the wear tolerances. If rods (items 34 and 35) are out of tolerance because the IVD coating has been scraped off, repair coating per (WP016 00 or WP016 01) and reinstall.

e. Reassemble joints and repeat freeplay inspection. If outboard leading edge flap fails a second freeplay inspection, engineering disposition is required.

6. WEAR TOLERANCES. See figure 2. Clearances that exceed those in figure require depot engineering disposition unless other specific information is given.

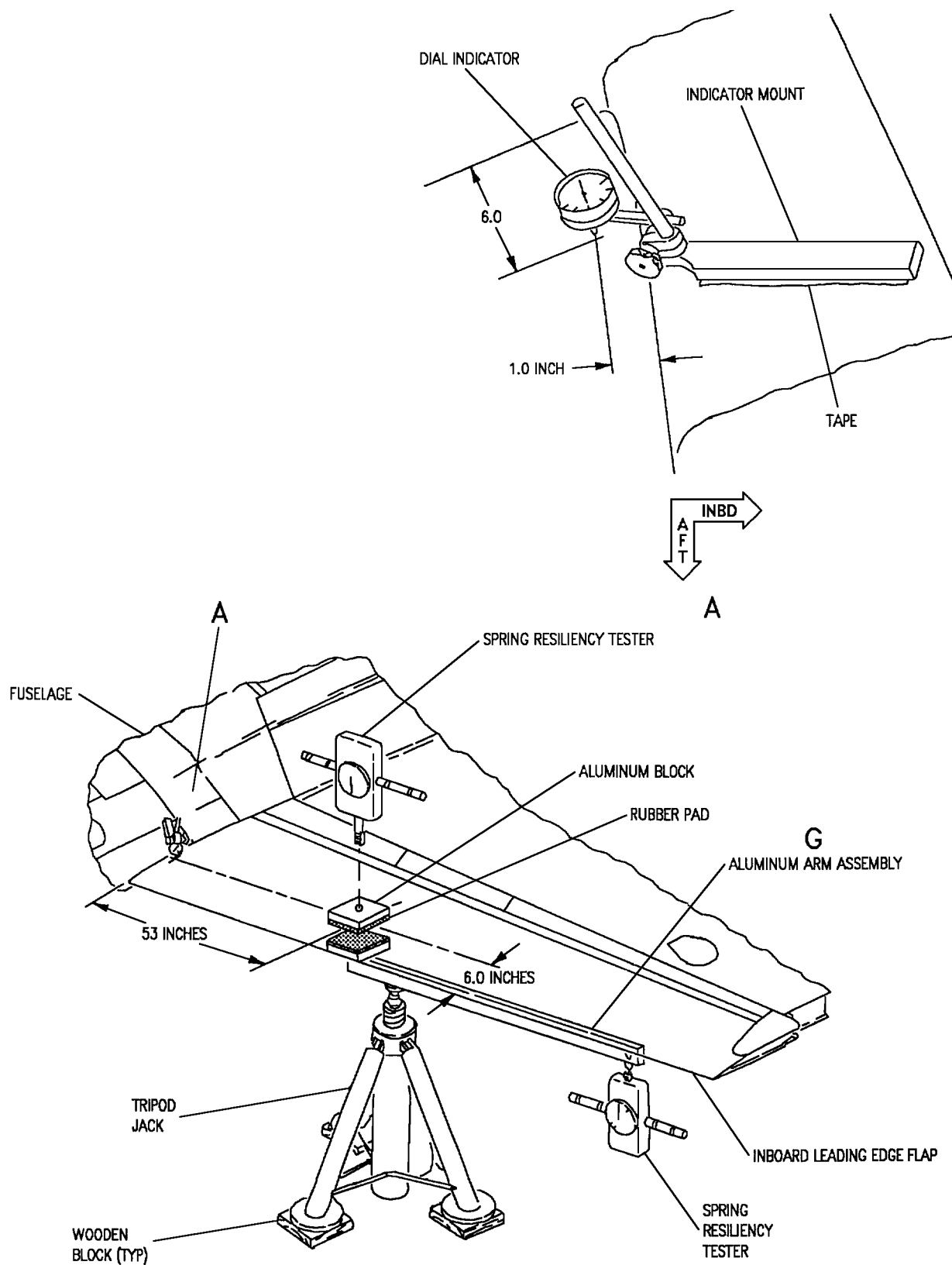
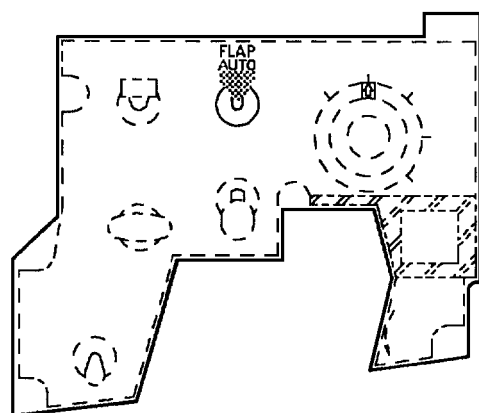
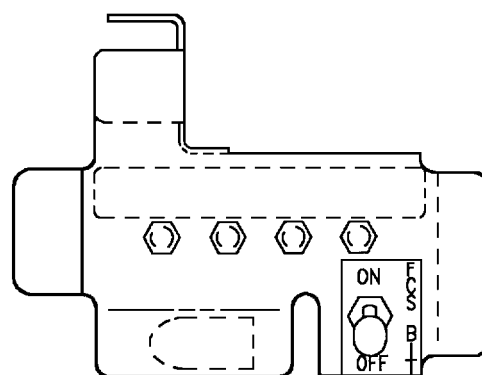


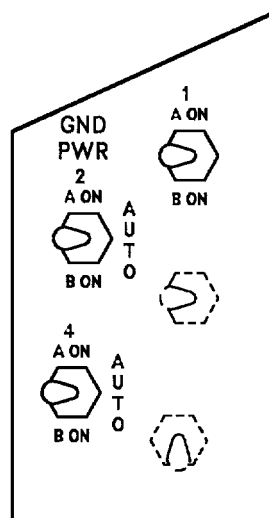
Figure 1. Free Play Inspection (Sheet 1)



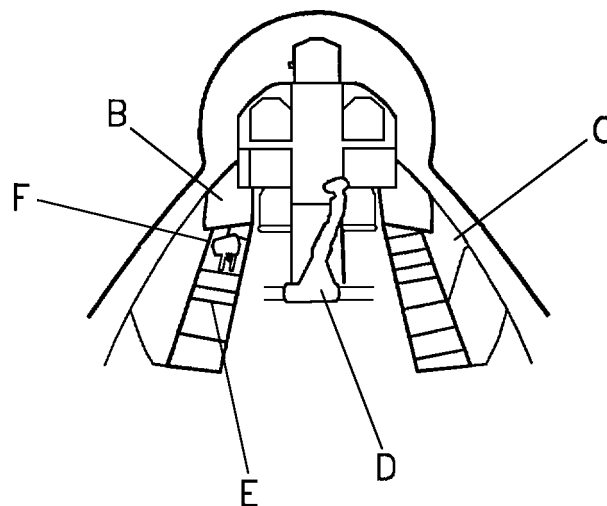
B



C



F



E

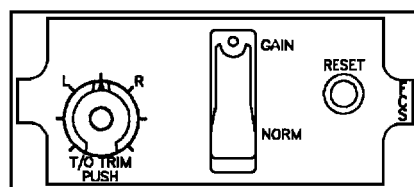
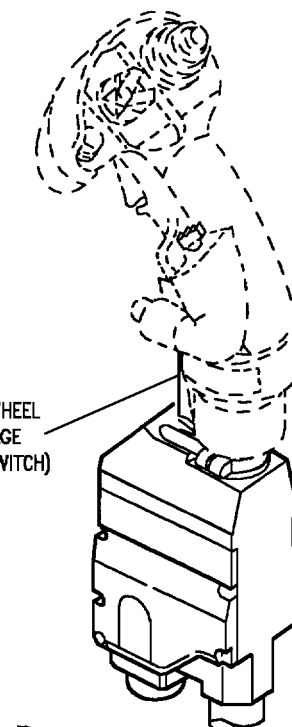


Figure 1. Free Play Inspection (Sheet 2)

AUTOPILOT/NOSEWHEEL
STEERING DISENGAGE
SWITCH(PADDLE SWITCH)



D

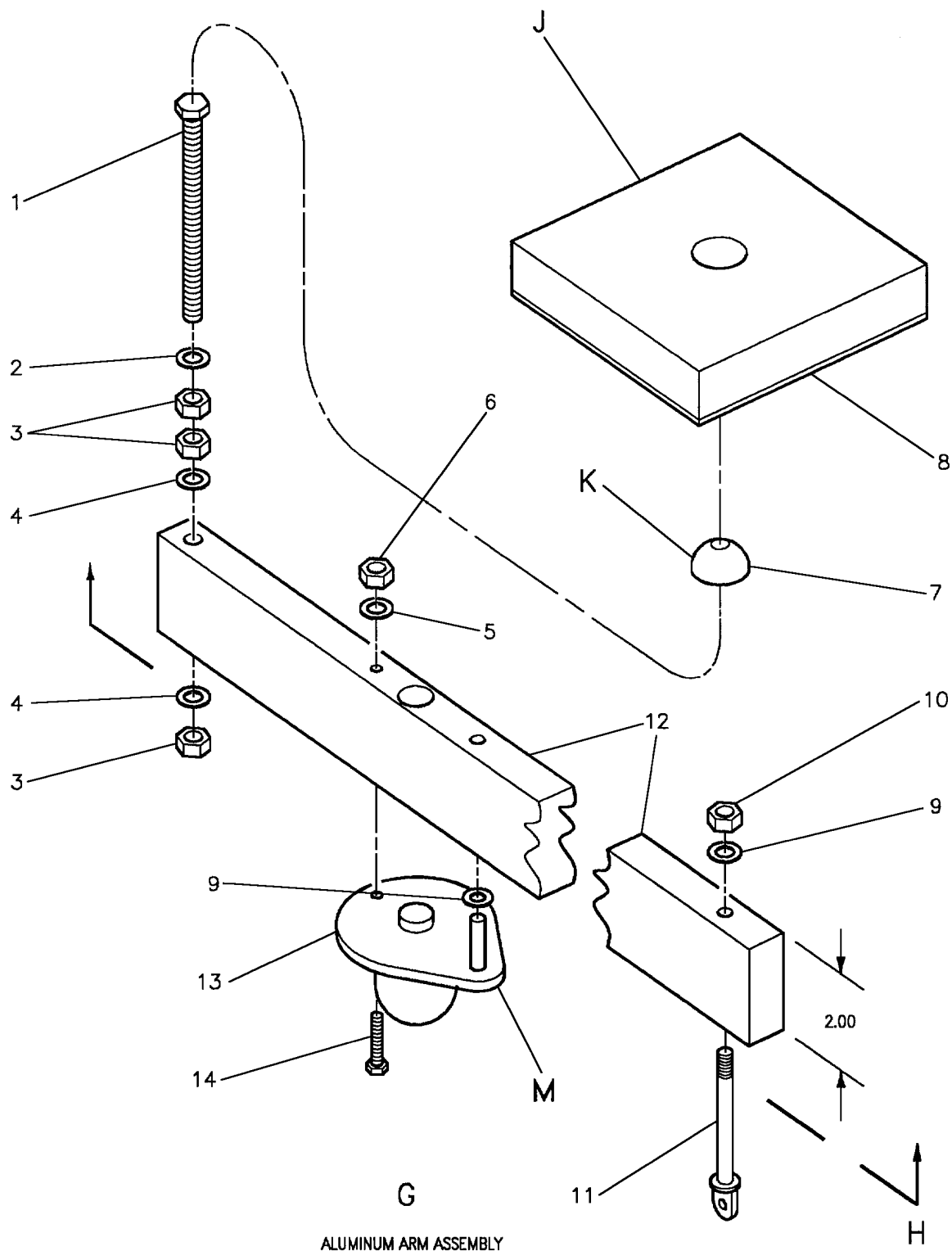


Figure 1. Free Play Inspection (Sheet 3)

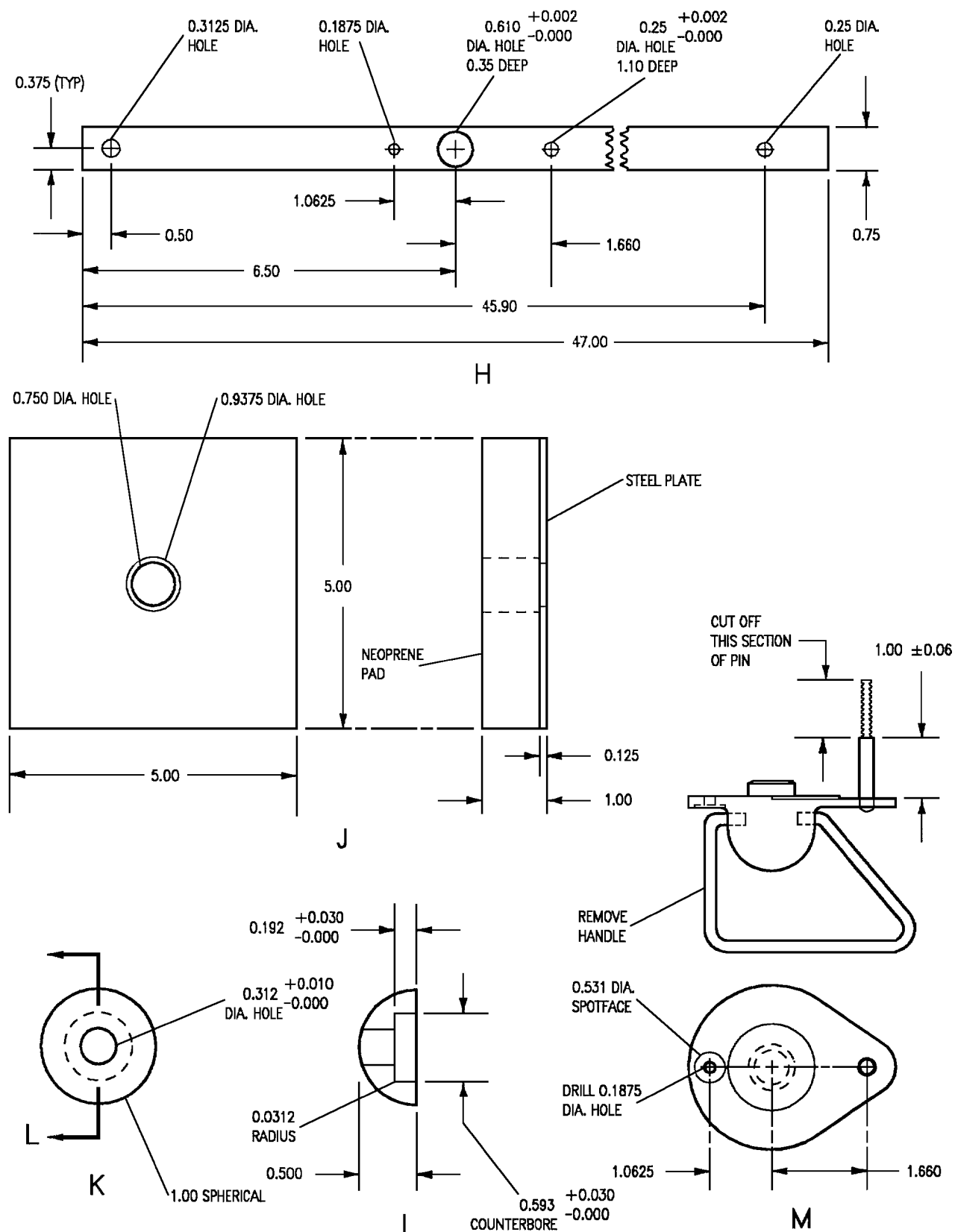






Figure 1. Free Play Inspection (Sheet 4)

16040104

INDEX NO.	PART NAME	SPECIFICATION OR PART NO.
1	BOLT, HEX HEAD	NAS428-5-42
2	WASHER, FLAT	AN970-5
3	NUT	AN315-5
4	WASHER, FLAT	AN960JD516
5	WASHER, FLAT	AN960JD10
6	NUT	NAS1291-C3M
7	SWIVEL BALL	
8	TENSION PAD	
9	WASHER, FLAT	AN960JD416
10	NUT	NAS1291-C4M
11	EYE BOLT	AN43B-25A
12	ARM	
13	JACK PAD	 53E010004-1
14	BOLT, HEX HEAD	NAS1801-3-16





LEGEND	
	FABRICATE FROM MMS-202 STEEL ROD.
	FABRICATE NEOPRENE PAD FROM MIL-R-6130, TYPE 2, GRADE A, CONDITION FIRM; FABRICATE STEEL PLATE FROM QQ-S-633, COMP. 1018, COND. NORMALIZED; BOND NEOPRENE PAD TO STEEL PLATE USING MIL-S-83430; FOR SEALANT PREPARATION AND APPLICATION (A1-F18AC-SRM-200, WPO11 00).
	FABRICATE FROM 6061-T6511, QQ-A-200/8 ALUMINUM ALLOY, 47.00 X 0.75 X 2.00 BAR STOCK.
	NSN 1730-00-963-5987, F-4 WING/FUSELAGE JACK PAD.

Figure 1. Free Play Inspection (Sheet 5)

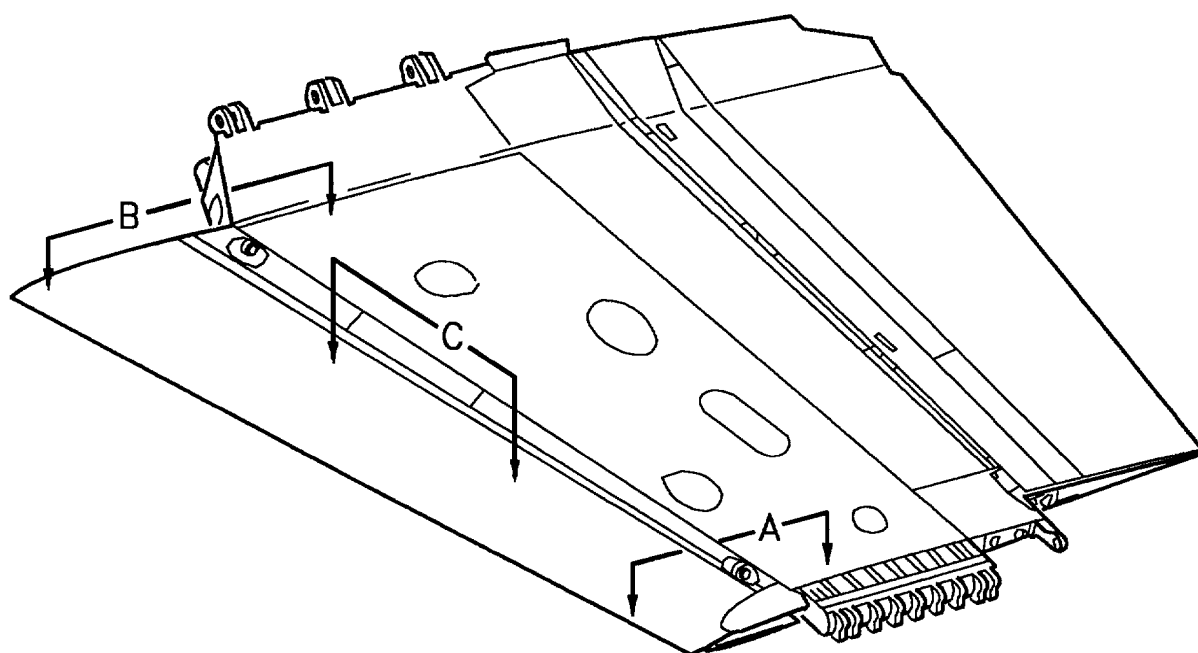


Figure 2. Wear Tolerances (Sheet 1)

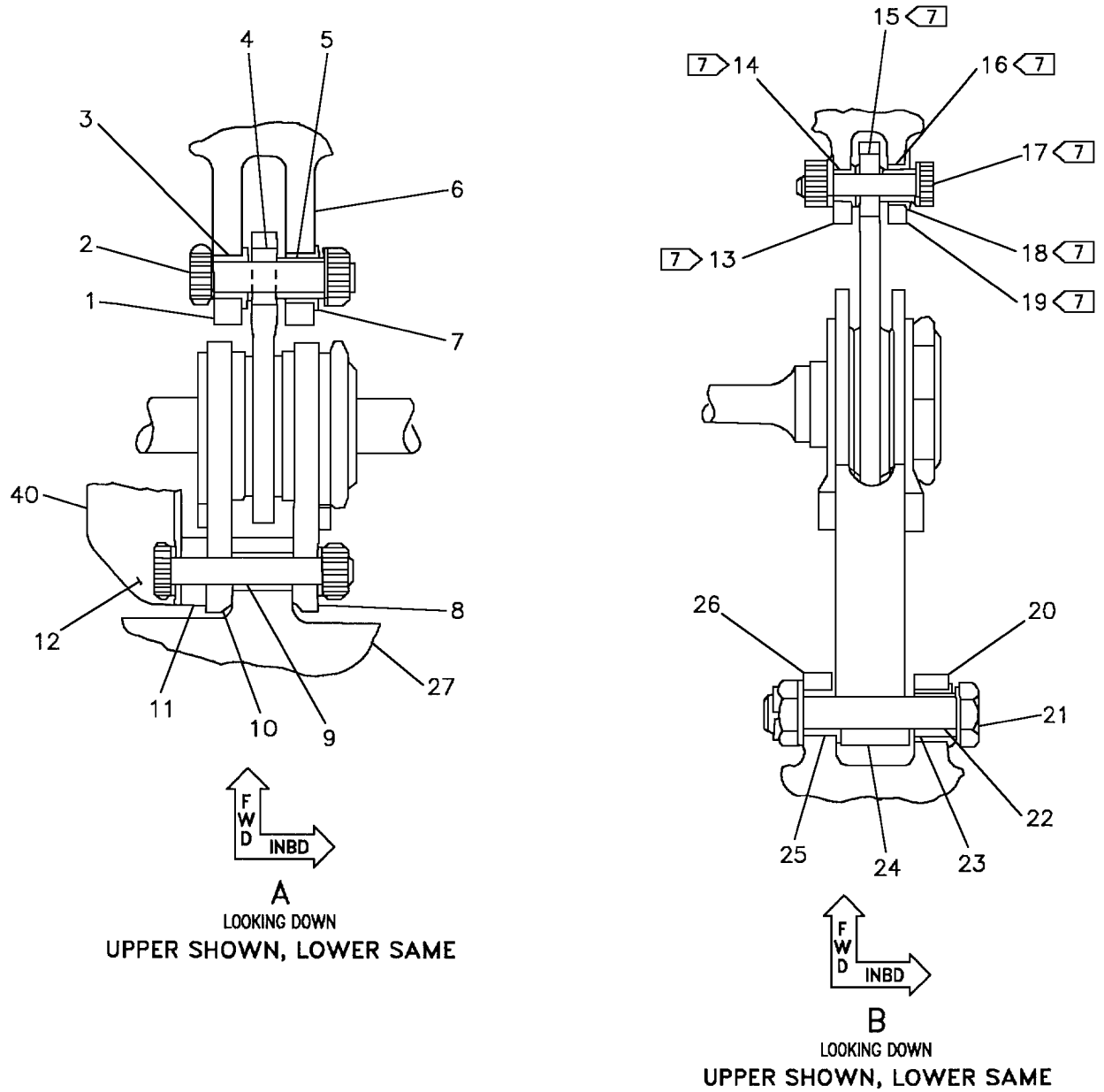


Figure 2. Wear Tolerances (Sheet 2)

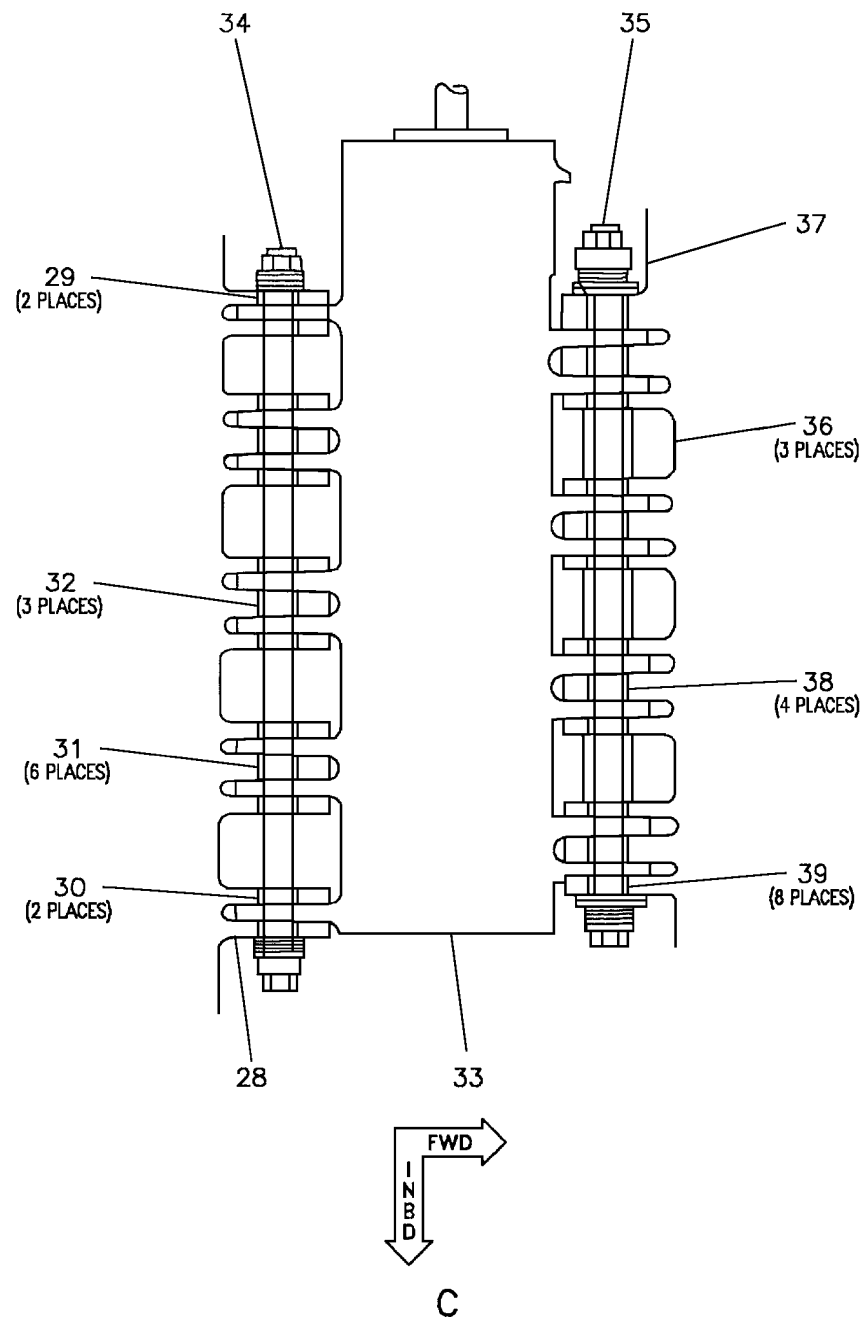


Figure 2. Wear Tolerances (Sheet 3)











































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					CLEARANCE	
A	1	 74A190654  74A190664	SPAR HINGE SPAR HINGE	0.5626 +0.0005 -0.0005 0.5621 +0.0010 -0.0000	 	
	2	ST3M744-7D-25	BOLT	0.4370 +0.0000 -0.0005		
	3	 ST4M139BC7-38	BUSHING	0.4370 +0.0022 -0.0000 ID 0.5640 +0.0000 -0.0007 OD		0.4370 +0.0027 -0.0000 ID NA
		 4M279-07002	BUSHING	0.4375 +0.0015 -0.0000 ID 0.5616 +0.0000 -0.0010 OD		0.4375 +0.0022 -0.0000 ID NA
	4	MS14101-7	BEARING	0.4375 +0.0000 -0.0005 ID 0.9062 +0.0000 -0.0005 OD		NA
	5	ST4M166-7-009	BUSHING	0.4375 +0.0010 -0.0000 ID 0.5615 +0.0000 -0.0005 OD	 	0.4375 +0.0012 -0.0000 ID 0.5615 +0.0000 -0.0010 OD
	6	 74A190654	SPAR HINGE	0.6875 +0.0005 -0.0005		
		 74A190664	SPAR HINGE	0.6870 +0.0010 -0.0000		
	7	 ST4M139BC9-38	BUSHING	0.5620 +0.0005 -0.0000 ID 0.6902 +0.0000 -0.0010 OD		0.5620 +0.0010 -0.0000 ID NA
		 4M279-09001	BUSHING	0.5620 +0.0005 -0.0000 ID 0.6865 +0.0000 -0.0010 OD		0.5620 +0.0010 -0.0000 ID NA
	8	74A670260	IDLER HINGE	0.3745 +0.0020 -0.0000		0.3745 +0.0030 -0.0000
	9	 ST4M219-06002	BUSHING	0.3785 +0.0007 -0.0000 ID 0.5010 +0.0000 -0.0010 OD		0.3785 +0.0017 -0.0000 ID NA
		 ST4M219-06007	BUSHING	0.3785 +0.0007 -0.0000 ID		0.3785 +0.0017 -0.0000 ID
	10	74A670260	IDLER HINGE	0.3745 +0.0020 -0.0000		0.3745 +0.0030 -0.0000
	11	74A110866-3229	SPACER	0.3750 +0.0007 -0.0000		0.3750 +0.0015 -0.0000
	12	ST3M744-6D-34	BOLT	0.3745 +0.0000 -0.0005		
B	13	 74A190654	SPAR HINGE	0.4375 +0.0005 -0.0005		
		 74A190664	SPAR HINGE	0.4370 +0.0010 -0.0000		
	14	 ST4M139BC5-27	BUSHING	0.3120 +0.0022 -0.0000 ID 0.4396 +0.0000 -0.0005 OD		0.3120 +0.0027 -0.0000 ID NA
		 4M279-05001	BUSHING	0.3125 +0.0015 -0.0000 ID 0.4365 +0.0000 -0.0010 OD		0.3125 +0.0022 -0.0000 ID NA
	15	MS14101-5A	BEARING	0.3125 +0.0000 -0.0005 ID 0.7500 +0.0000 -0.0005 OD		 NA
	16	ST4M166-5-007	BUSHING	0.3125 +0.0010 -0.0000 ID 0.4365 +0.0000 -0.0005 OD	 	0.3125 +0.0012 -0.0000 ID 0.4365 +0.0000 -0.0010 OD
	17	ST3M744-5D-20	BOLT	0.3120 +0.0000 -0.0005		

Figure 2. Wear Tolerances (Sheet 4)

DET	INDEX NO	PART NUMBER	PART NAME	IN SERVICE TOLERANCE	
				MANUFACTURING TOLERANCES	CLEARANCE
B	18	1 ST4M139BC7-27	BUSHING	0.4370 +0.0005 -0.0000 ID 0.5648 +0.0000 -0.0007 OD	12 0.4370 +0.0010 -0.0000 ID NA
		2 4M279-07001	BUSHING	0.4375 +0.0005 -0.0000 ID 0.5616 +0.0000 -0.0010 OD	12 0.4375 +0.0010 -0.0000 ID NA
	19	1 74A190654	SPAR HINGE	0.5626 +0.0005 -0.0005	10
		2 74A190664	SPAR HINGE	0.5621 +0.0010 -0.0000	10
	20	3 74A110604	SPAR HINGE	5 0.8125 +0.0005 -0.0005 6 0.6875 +0.0005 -0.0005	10 10
		4 74A110604	SPAR HINGE	5 0.7495 +0.0020 -0.0000 6 0.6870 +0.0020 -0.0000	10 10
	21	NAS658V39D	BOLT	5 0.4995 +0.0000 -0.0005	10 11
		NAS657V39D	BOLT	6 0.4370 +0.0000 -0.0005	10 11
	22	ST4M166-8-0115	BUSHING	5 0.5000 +0.0010 -0.0000 ID 5 0.6240 +0.0000 -0.0005 OD	11 0.5000 +0.0012 -0.0000 ID 11 0.6240 +0.0000 -0.0010 OD
		ST4M166-7-0115	BUSHING	6 0.4375 +0.0010 -0.0000 ID 6 0.5615 +0.0000 -0.0005 OD	11 0.4375 +0.0012 -0.0000 ID 11 0.5615 +0.0000 -0.0010 OD
	23	3 ST4M139P10-57	BUSHING	5 0.6245 +0.0005 -0.0000 ID 5 0.8152 +0.0000 -0.0010 OD	12 0.6245 +0.0010 -0.0000 ID NA
		4 4M279-10001	BUSHING	5 0.6245 +0.0005 -0.0000 ID 5 0.7490 +0.0000 -0.0010 OD	12 0.6245 +0.0010 -0.0000 ID NA
		3 ST4M139P9-57	BUSHING	6 0.5620 +0.0005 -0.0000 ID 6 0.6902 +0.0000 -0.0010 OD	12 0.5620 +0.0010 -0.0000 ID NA
		4 4M279-09002	BUSHING	6 0.5620 +0.0005 -0.0000 ID 6 0.6865 +0.0000 -0.0010 OD	12
	24	74A670223	IDLER HINGE	5 0.4995 +0.0022 -0.0000 6 0.4370 +0.0022 -0.0000	0.4995 +0.0032 -0.0000 0.4370 +0.0032 -0.0000
	25	3 ST4M139P8-57	BUSHING	5 0.4995 +0.0005 -0.0000 ID 5 0.6275 +0.0000 -0.0008 OD	12 0.4995 +0.0020 -0.0000 ID NA
		4 4M279-08001	BUSHING	5 0.4995 +0.0005 -0.0000 ID 5 0.6240 +0.0000 -0.0010 OD	12 0.4995 +0.0020 -0.0000 ID NA
		3 ST4M139P7-57	BUSHING	6 0.4370 +0.0005 -0.0000 ID 6 0.5648 +0.0000 -0.0007 OD	12 0.4370 +0.0020 -0.0000 ID NA
		4 4M279-07003	BUSHING	5 0.4370 +0.0005 -0.0000 ID 6 0.5616 +0.0000 -0.0010 OD	12
	26	3 74A110604	SPAR HINGE	5 0.6250 +0.0005 -0.0005 6 0.5626 +0.0005 -0.0005	10 10
		4 74A110604	SPAR HINGE	5 0.6245 +0.0020 -0.0000 6 0.5621 +0.0020 -0.0000	10 10

Figure 2. Wear Tolerances (Sheet 5)

DET	INDEX NO	PART NUMBER	PART NAME		IN SERVICE TOLERANCE
				MANUFACTURING TOLERANCES	CLEARANCE
A	27	74A110604	SPAR HINGE	0.5015 +0.0022 -0.0000	
C	28	74A110604	SPAR	0.7865 +0.0022 -0.0000	
	29	ST4M219-10009	BUSHING	0.6635 +0.0007 -0.0000 ID	0.6635 +0.0014 -0.0000 ID
	30	ST4M219-10010	BUSHING	0.6635 +0.0007 -0.0000 ID	0.6635 +0.0014 -0.0000 ID
	31	ST4M219-10011	BUSHING	0.6635 +0.0007 -0.0000 ID	0.6635 +0.0014 -0.0000 ID
	32	ST4M219-10012	BUSHING	0.6635 +0.0007 -0.0000 ID	0.6635 +0.0014 -0.0000 ID
	33	2022636	TRANSMISSION	0.6636 +0.0004 -0.0000	0.6636 +0.0009 -0.0000
	34	74A670231-2027	ROD	0.6630 +0.0000 -0.0011	
	35	74A670231-2029	ROD	0.6630 +0.0000 -0.0011	
	36	4M106-10003	BUSHING	0.668 +0.002 -0.000 ID	
	37	74A190654	SPAR	0.7865 +0.0022 -0.0000	
		74A190654	SPAR	0.7865 +0.0022 -0.0000	
	38	ST4M219-10008	BUSHING	0.6635 +0.0007 -0.0000 ID	0.6635 +0.0014 -0.0000 ID
	39	ST4M219-10007	BUSHING	0.6635 +0.0007 -0.0000 ID	0.6635 +0.0014 -0.0000 ID
		ST4M219-10034	BUSHING	0.6635 +0.0007 -0.0000 ID	0.6635 +0.0014 -0.0000 ID
A	40	74A110660-2103 74A110660-2104	SEAL FORMER	0.375 +0.007 -0.000	

LEGEND

- 161353 THRU 161519
- 161520 AND UP
- 161353 THRU 161720
- 161721 AND UP
- UPPER
- LOWER
- TYPICAL UPPER AND LOWER
- BONDED JOINT WEAR TOLERANCE NOT APPLICABLE
- IF IVD COATING IS WORN OFF, REPAIR PER WPO16 00, WPO16 01
- NONE ALLOWED
- REPLACE WHEN TOLERANCE EXCEEDED
- WEAR LIMITS SHOWN IN THIS CHART HAVE BEEN DETERMINED CONSIDERING THE WORST CASE CONDITIONS. THEREFORE, IF THE FORCE MATE OR PRESS FIT BUSHINGS ARE BEYOND THE WEAR LIMITS LISTED, CHECK THE FREEPLAY TEST FIRST BEFORE REPLACING. IF THE FREEPLAY TEST CAN BE PASSED, DO NOT REPLACE THE BUSHINGS.

Figure 2. Wear Tolerances (Sheet 6)

DEPOT MAINTENANCE

STRUCTURE REPAIR

INBOARD LEADING EDGE FLAP

MAINTENANCE FIXTURE, RE174190003

Reference Material

None

Alphabetical Index

Subject	Page No.
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Alignment and Drilling For Rigging Rivet	23
Installation of Inboard Leading Edge Flap into Maintenance Fixture	1
Installation of Seals, 74A190617, 74A190623, 74A190627, and 74A190632	10
Installation of 74A190669, Leading Edge Skin	19
Installation of 74A190673 Upper Fairing, and 74A190674 Lower Fairing	14
Mold Line Contour Inspection	7

Record of Applicable Technical Directives

None

1. DESCRIPTION.

EDGE FLAP INTO MAINTENANCE FIXTURE.
See figure 1.

2. The inboard leading edge flap maintenance fixture (fixture) is used to evaluate and repair the inboard leading edge flap (flap). The fixture contains locators for various details on the flap, and supports to hold the flap in position during repair action. The supports and locators also serve as gaging surfaces for damage inspection. Minor damage repairs and trimmings may be done in the fixture. The fixture requires accurate leveling and verification with an alignment kit before use, and should be gage recycled with the inboard leading edge flap alignment kit to verify fixture remains accurate.

Support Equipment Required

None

Materials Required

None

a. Place flap on work surface and inspect alignment of transmission lug holes by inserting pins (detail 111).

b. Insert L-pins (detail 169) through locators (details 102, 103, and 101), view A, B, and C, respectively.

3. INSTALLATION OF INBOARD LEADING

c. Align flap hinge and transmission ribs with applicable details of fixture and insert pins (detail 105) through locator (detail 103) and into transmission lugs, view B.

d. Insert pins (detail 106) through outboard hinge lug and locator (detail 101), view C.

e. Insert pins (detail 104) through inboard hinge lug and locator (detail 102), view A.

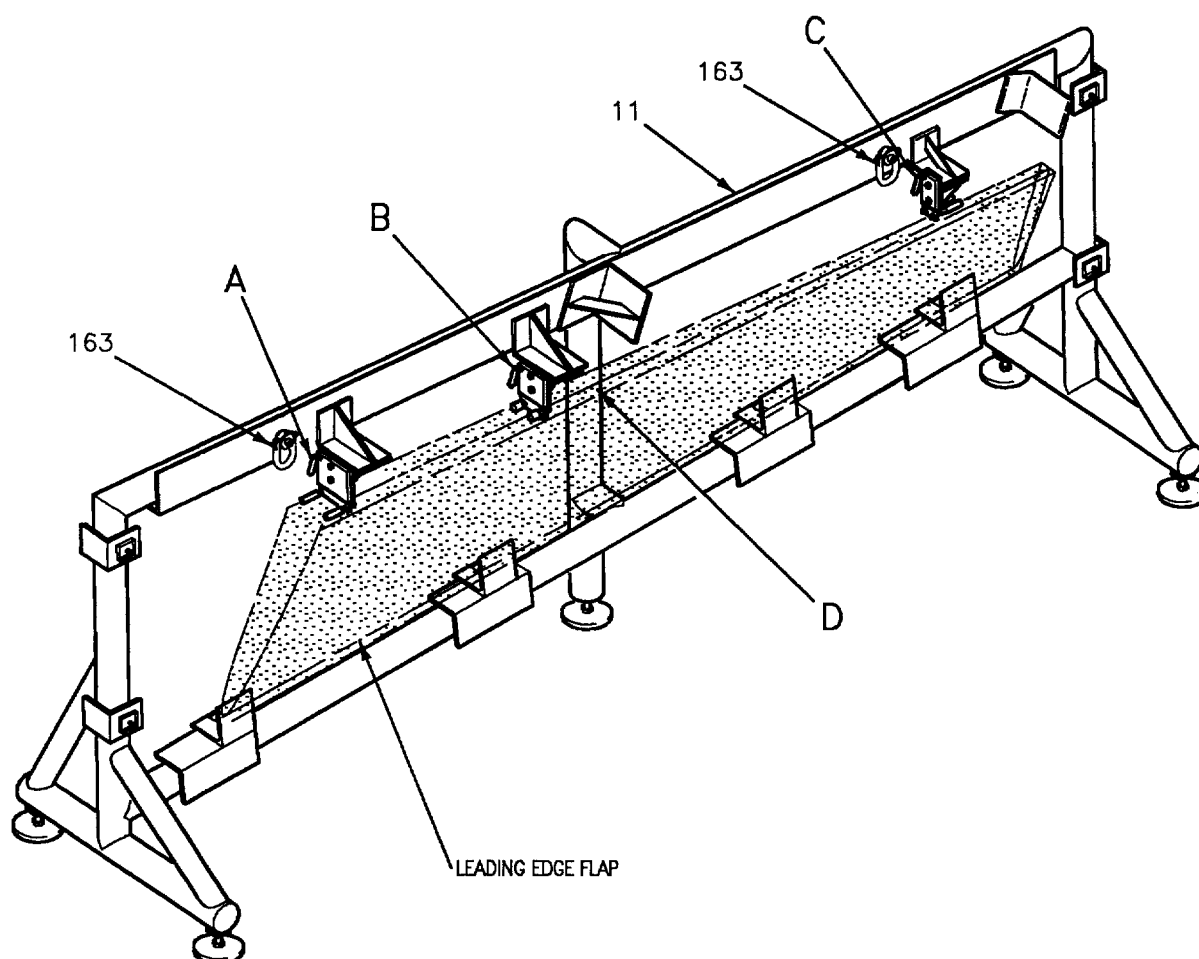


Figure 1. Installation of Flap Into Maintenance Fixture (Sheet 1)

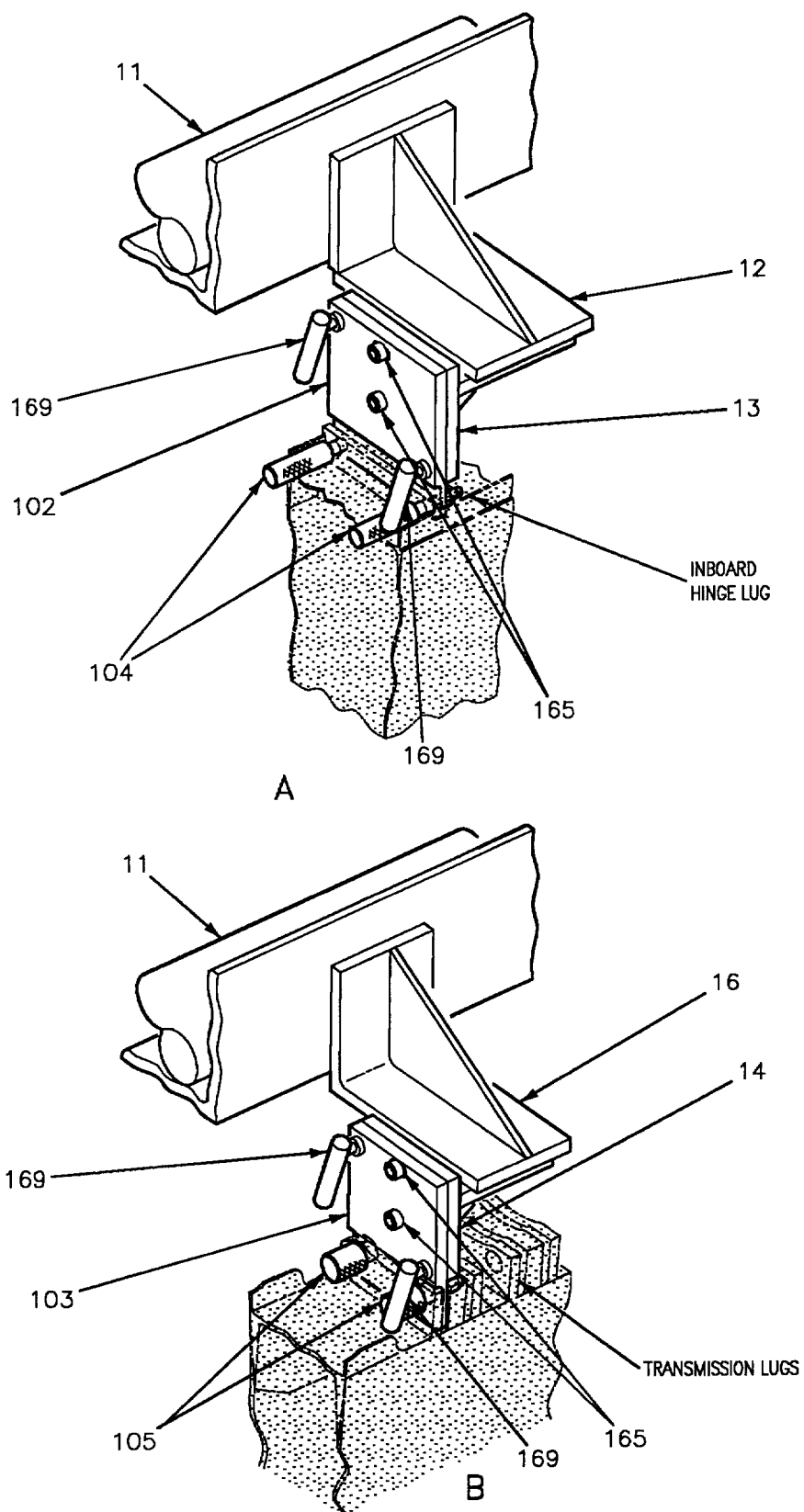
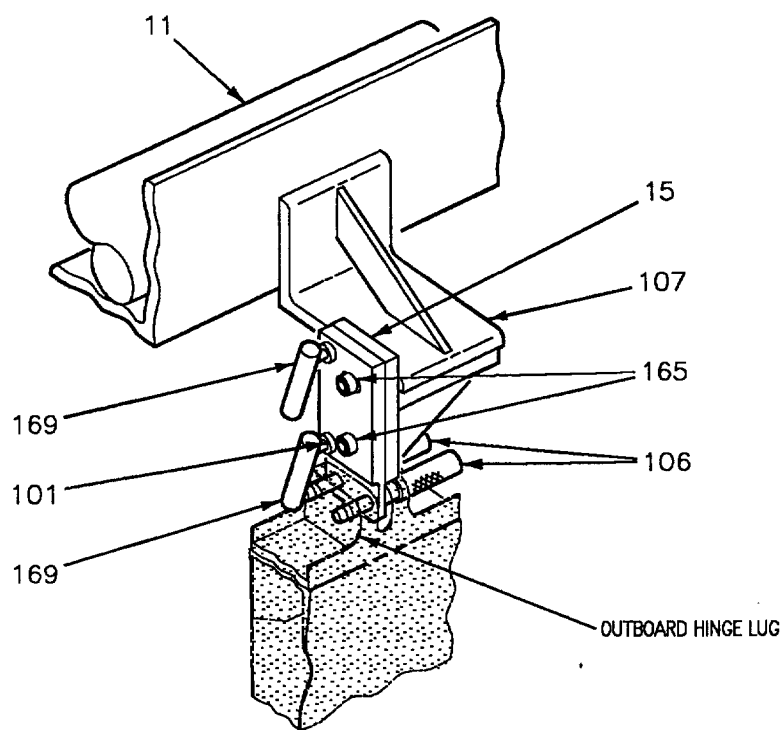
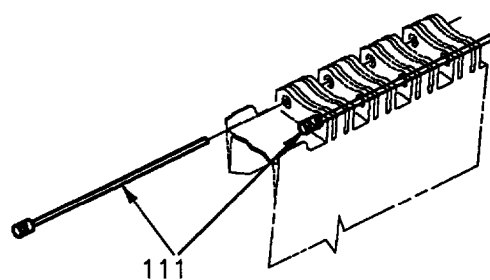


Figure 1. Installation of Flap Into Maintenance Fixture (Sheet 2)



C



D

BENCH INSPECTION OF
TRANSMISSION HOLE
ALIGNMENT

Figure 1. Installation of Flap Into Maintenance Fixture (Sheet 3)

Detail No.	Name	Function
11	Frame	Main support for all details.
12, 16	Support	Supports locators for pinning flap.
13	Locator	Locates detail for pinning flap at inboard hinge lugs.
14	Locator	Locates detail for pinning flap at transmission lugs.
15	Locator	Locates detail for pinning flap at outboard hinge lugs.
101	Locator	Locates detail for installing flap at outboard hinge lugs.
102	Locator	Locates details for installing flap at inboard hinge lugs.
103	Locator	Locates details for installing flap at transmission lugs.
104	Pin	Pins flap in fixture at inboard hinge lugs.
105	Pin	Pins flap in fixture at transmission hinge lugs.
106	Pin	Pins flap in fixture at outboard hinge lugs.
107	Support	Supports locators for pinning flap.
111	Pin	Inspects alignment of transmission lug holes.
163	Hoist Ring	Supports fixture while hoisting.
165	Shoulder Bolt	Attaches various details to fixture for flap installation.
169	L-Pin	Locates various details for pinning flap at hinge and transmission lugs.

Figure 1. Installation of Flap Into Maintenance Fixture (Sheet 4)

4. MOLD LINE CONTOUR INSPECTION. See figure 2.

Support Equipment Required

None

Materials Required

None

a. Install inboard contour board (detail 149) using L-pins (detail 132) and handknobs (detail 142), view A.

b. Install outboard contour boards (detail 148) using L-pins (detail 132) and handknobs (detail 142), view B.

c. Inspect gap between contour boards (details 148 and 149) and flap for a 0.250 nominal gap, views A and B.

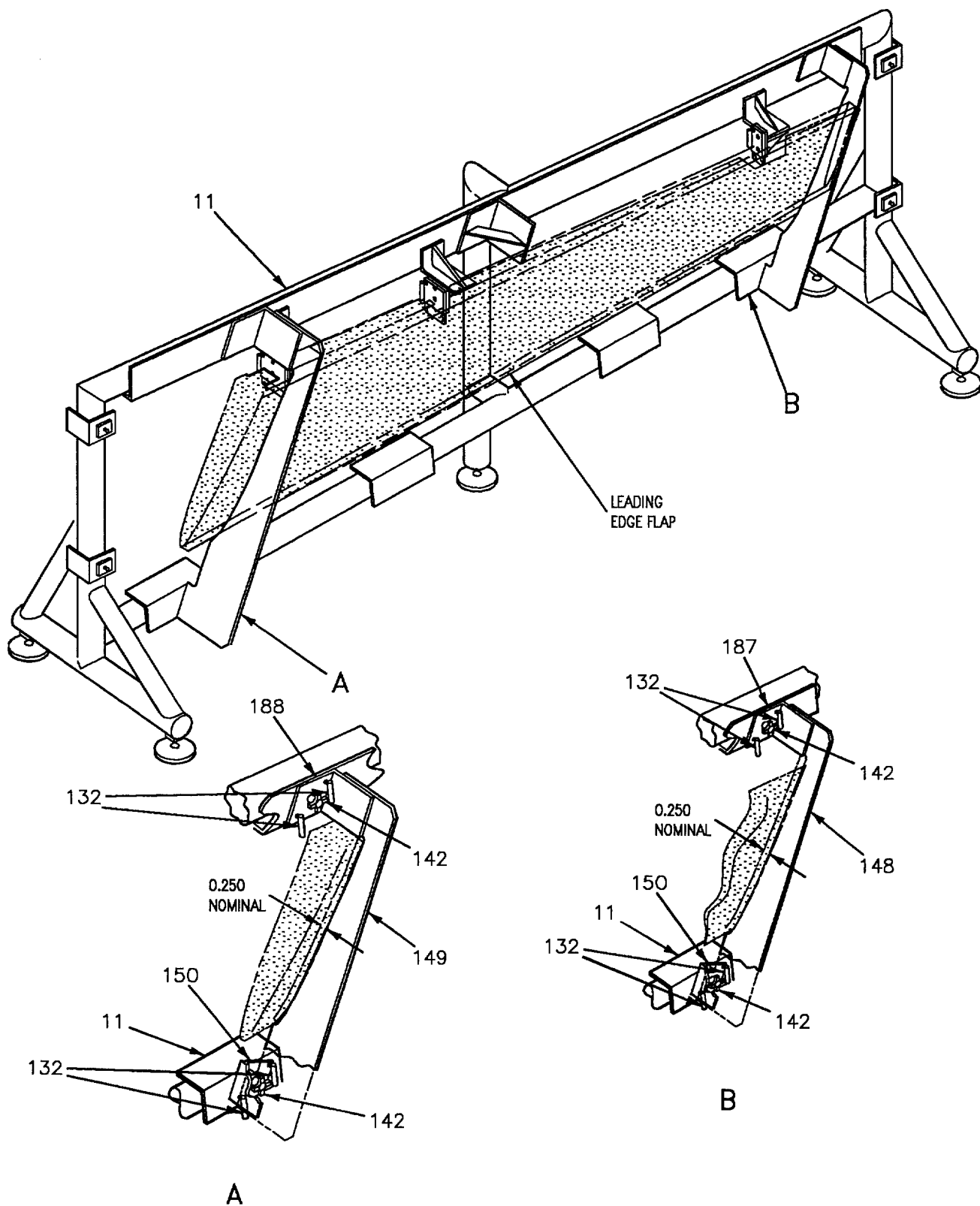


Figure 2. Mold Line Contour Inspection (Sheet 1)

Detail No.	Name	Function
11	Frame	Main support for all details.
132	L-Pin	Locates and attaches contour boards to frame.
142	Hand Knob	Secures contour boards to frame.
148	Contour Board	Inspects mold line contour at outboard end of flap.
149	Contour Board	Inspects mold line contour at inboard end of flap.
150	Angle	Attaches contour boards to fixture.
187	Angle	Attaches outboard contour board to fixture.
188	Angle	Attaches inboard contour board to fixture.

Figure 2. Mold Line Contour Inspection (Sheet 2)

5. INSTALLATION OF SEALS, 74A190617, 74A190623, 74A190627, AND 74A190632. See figure 3.

Support Equipment Required

None

Materials Required

None

6. Seals 74A190617 Lower, and 74A190627 Upper.

a. Install supports (detail 152) using handknobs (detail 129), view A.

b. Locate seals next to locators (detail 155), and next to flap structure, view A.

7. Seals 74A190623 Lower, and 74A190632 Upper and Lower.

a. Install supports (detail 152) using handknobs (detail 129), view B.

b. Install support (detail 22) using handknob (detail 164), view B.

c. Locate seals next to locators (detail 155), and next to flap structure, view B.

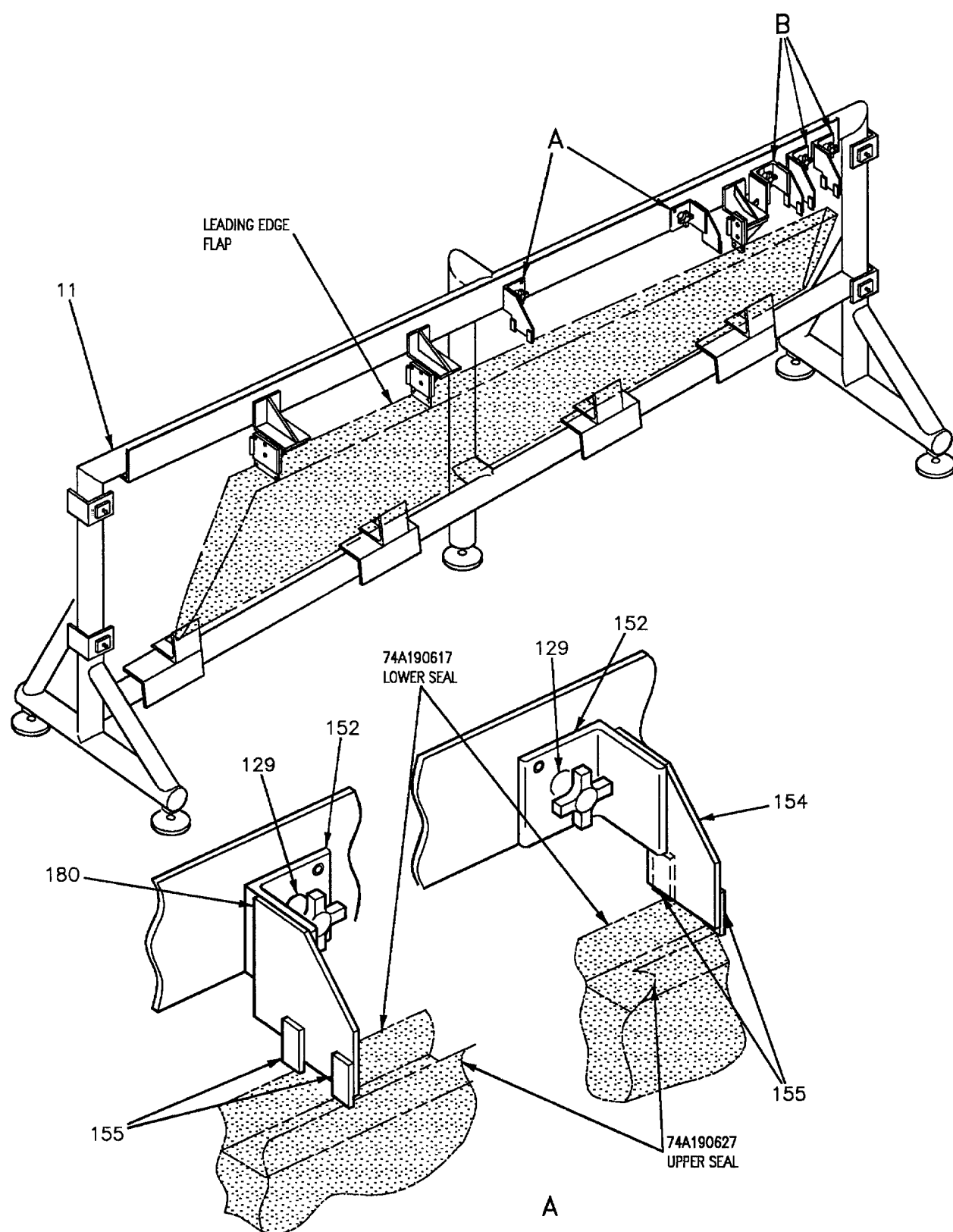


Figure 3. Installation of Seals (Sheet 1)

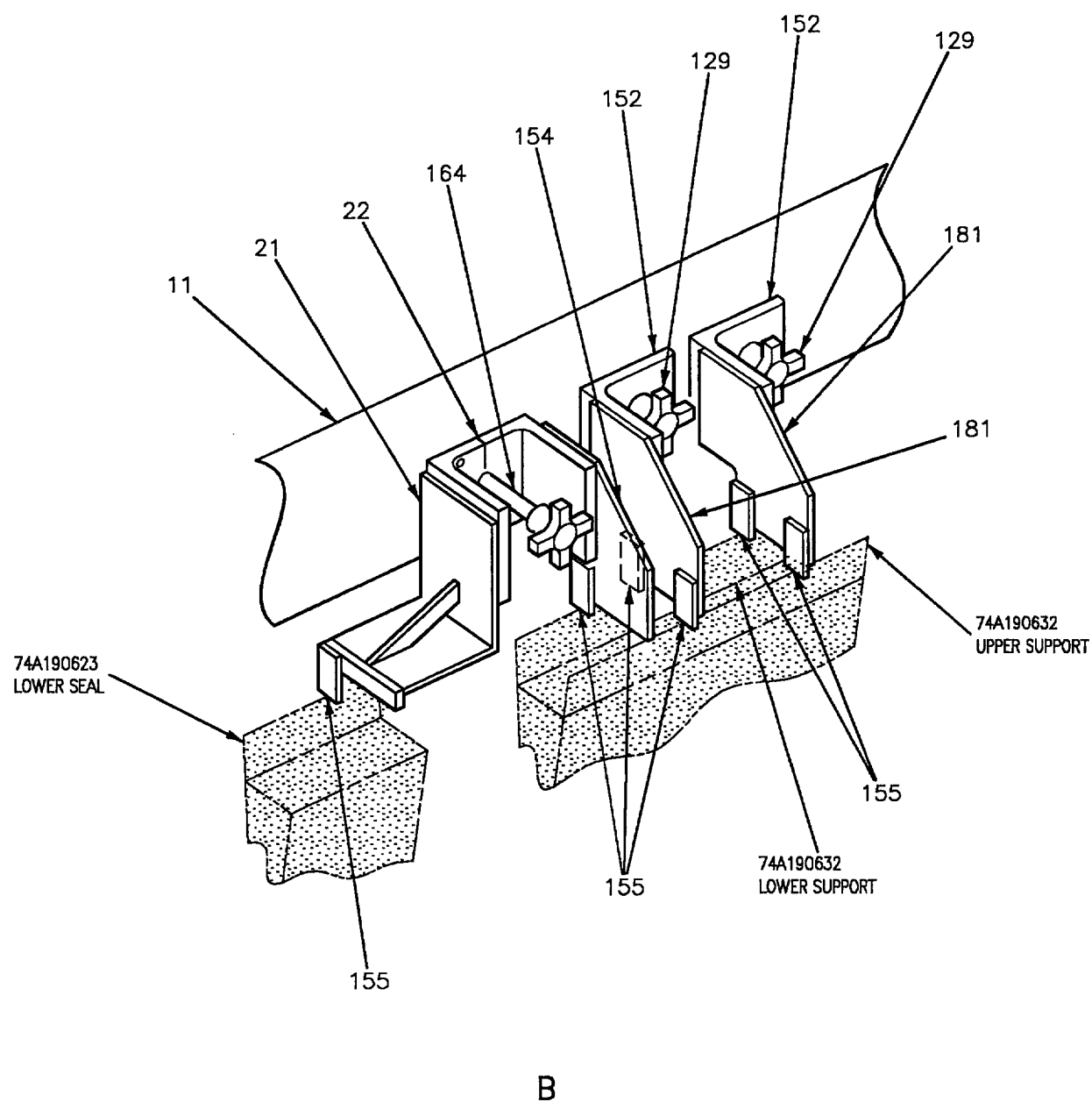


Figure 3. Installation of Seals (Sheet 2)

Detail No.	Name	Function
11	Frame	Main support for all details.
21	Locator	Locates details for installing seals.
22	Support	Supports details for installing seals.
129	Hand Knob	Secures supports to frame.
152	Support	Supports details for installing seals.
154	Locator	Locates details for installing seals.
155	Locator	Locates seals for installation.
164	Hand Knob	Secures support to frame.
180	Locator	Locates details for installing seals.
181	Locator	Locates details for installing seals.

Figure 3. Installation of Seals (Sheet 3)

8. INSTALLATION OF 74A190673 UPPER FAIRING, AND 74A190674 LOWER FAIRING. See figure 4.

Support Equipment Required

None

Materials Required

None

a. Retract swivel clamps (details 118, 122, 123, 124, 125, 126, and 127) on locators (detail 19 and 23) by turning knurled nut (detail 25), view A.

b. Install locators (details 19 and 23) by sliding over outboard end of flap, and attach to frame (detail 11) using L-pins (detail 132) and hand knobs (detail 142), view A.

c. Attach locating bars (detail 113 and 200) to locators (detail 19 and 23) using hand knobs (detail 142), making sure each locating bar contacts outboard edge of flap at upper and lower mold line, view A.

d. Attach support (detail 192) and locator (detail 191) to frame (detail 11) using L-pins (detail 194) and hand knob (detail 193), view B.

e. Locate upper fairing on flap, making sure it contacts both locator bars (detail 113 and 200) and locator (detail 191), view C.

NOTE

Make sure all swivel clamps have aircraft direction arrows facing correct way.

f. Clamp fairing in place, with swivel clamps (details 118, 122, 123, and 124), using light pressure, by turning knurled nuts (detail 25), view C.

g. Locate lower fairing on flap, making sure it contacts both locator bars (details 113 and 200) and locator (detail 191), view C.

h. Clamp fairing in place with swivel clamps (details 125, 126, and 127), using light pressure, by turning knurled nuts (detail 25), view C.

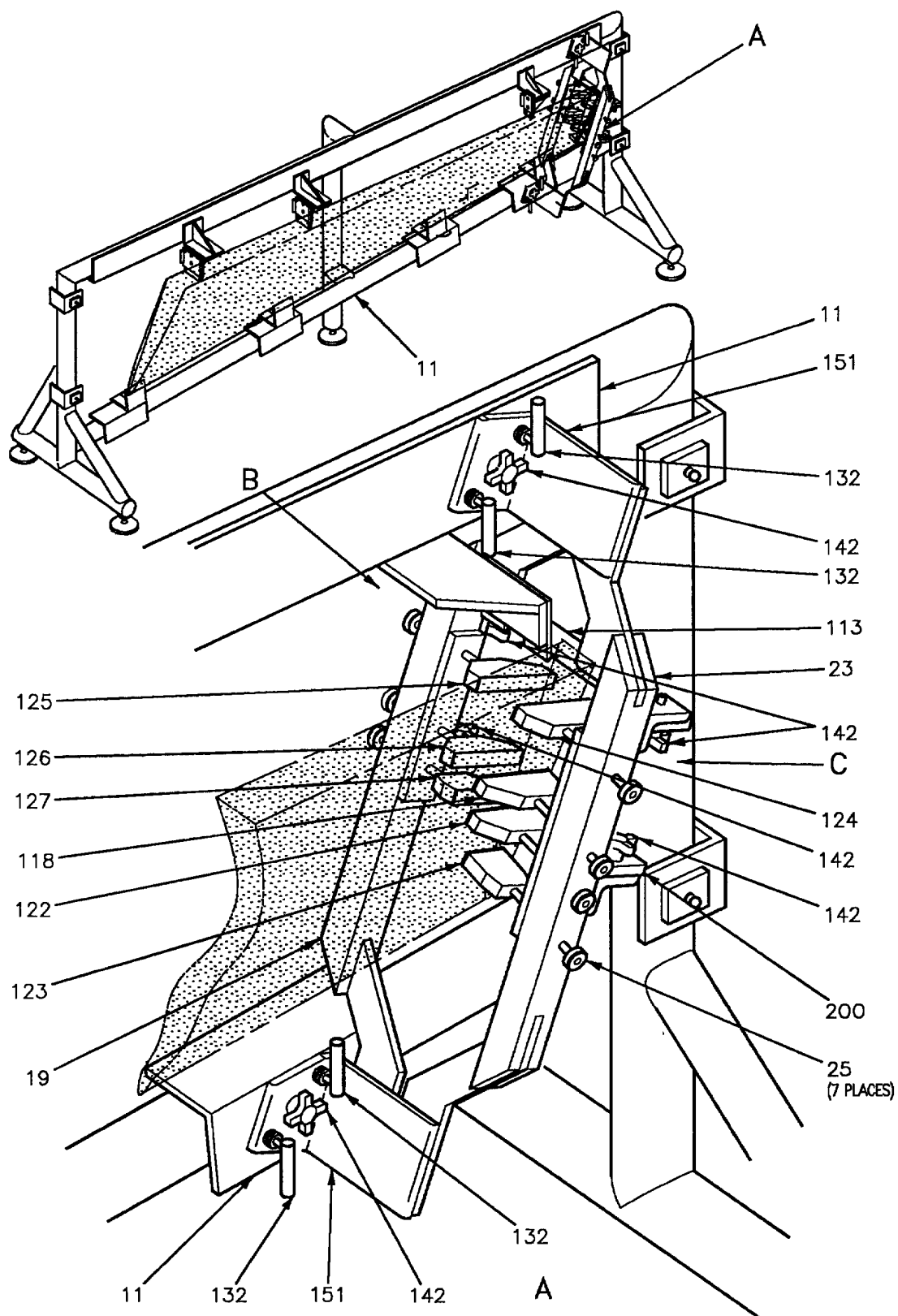
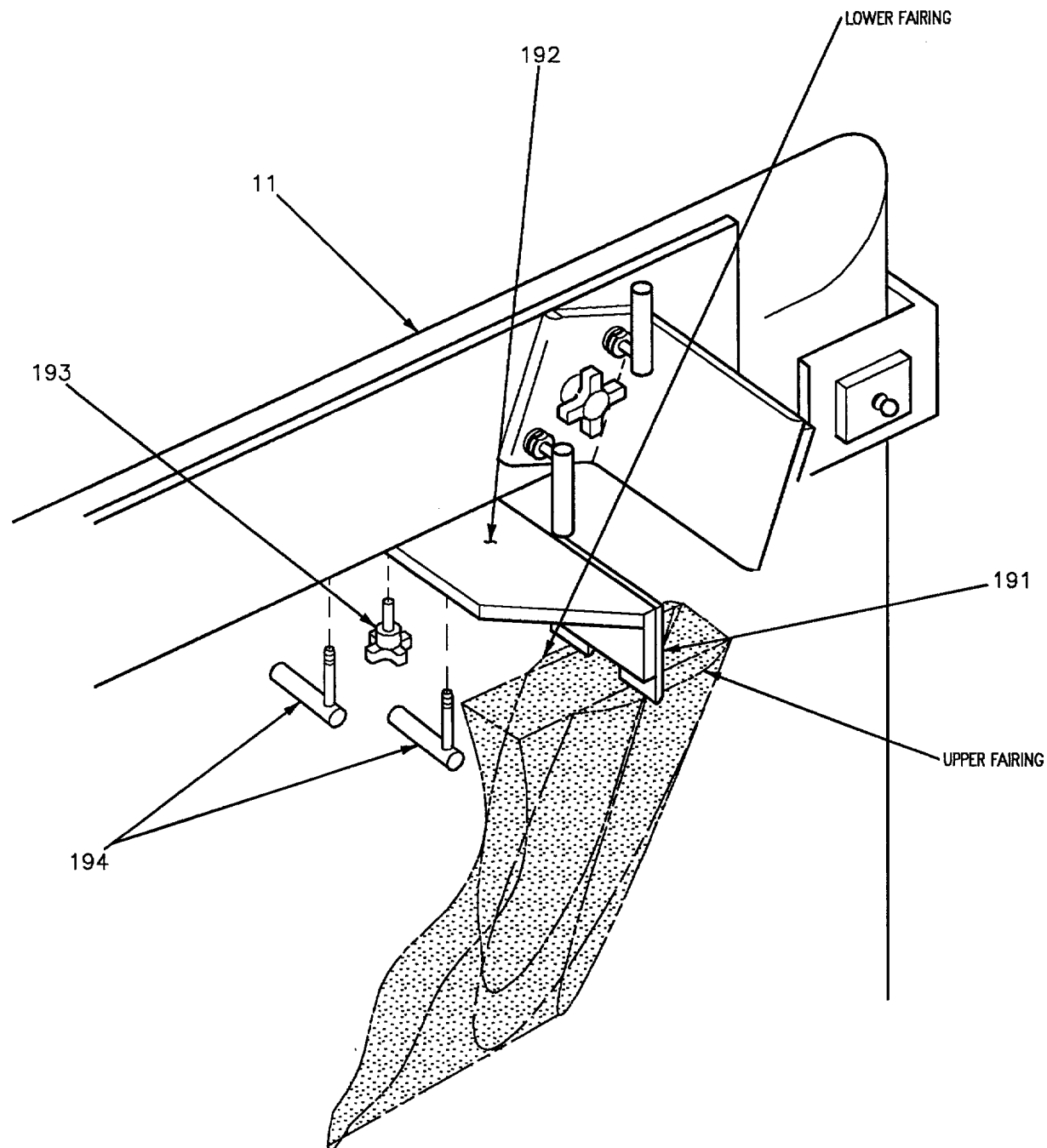


Figure 4. Installation of Upper and Lower Fairings (Sheet 1)



B

Figure 4. Installation of Upper and Lower Fairings (Sheet 2)

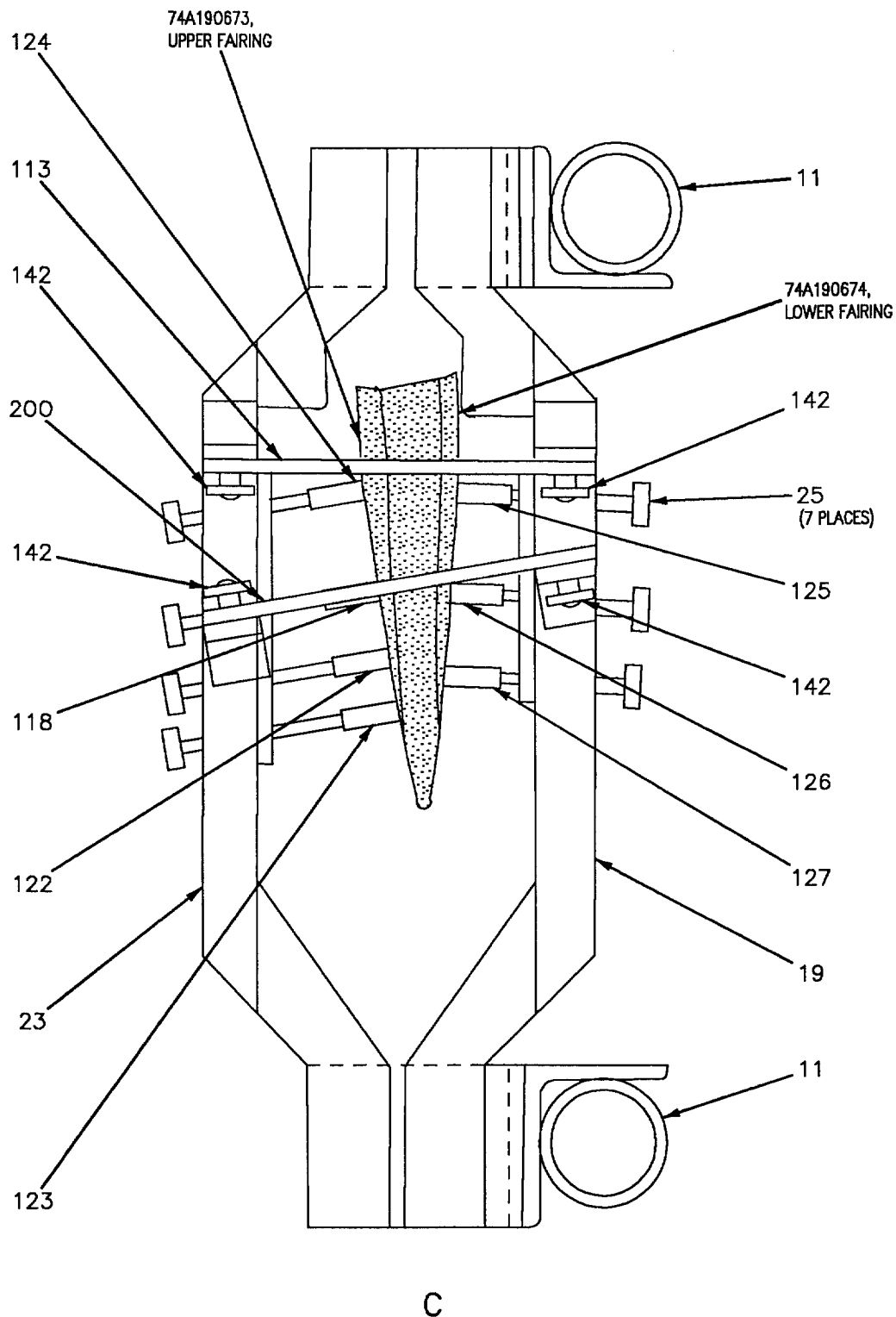


Figure 4. Installation of Upper and Lower Fairings (Sheet 3)

Detail No.	Name	Function
11	Frame	Main support for all details.
19	Locator	Locates detail for installing upper fairing.
23	Locator	Locates detail for installing lower fairings.
25	Knurled Nut	Adjust details for clamping fairings in place.
113	Locating Bar	Locates fairing for outboard position.
118, 122, 123 and 124	Swivel Clamp	Secures upper fairing in place on flap.
125, 126, and 127	Swivel Clamp	Secures lower fairing in place on flap.
132	L-Pin	Locates and attaches locators (detail 19 and 23) to frame.
142	Hand Knob	Secures various details to fixture.
151	Support	Supports locators (detail 19 and 23).
191	Locator	Locate upper and lower fairings in aft position.
192	Support	Supports detail for locating fairings.
193	Hand Knob	Secures support for locating fairings.
194	L-Pin	Locates and attaches support (detail 192).
200	Locating Bar	Locates fairings for outboard position.

Figure 4. Installation of Upper and Lower Fairings (Sheet 4)

9. INSTALLATION OF 74A190669, LEADING EDGE SKIN. See figure 5.

Support Equipment Required

None

Materials Required

None

a. With flap installed in fixture, locate replacement leading edge skin in position on flap.

b. Attach brackets (detail 20) to frame (detail 11) using hand knobs (detail 197) views A and B.

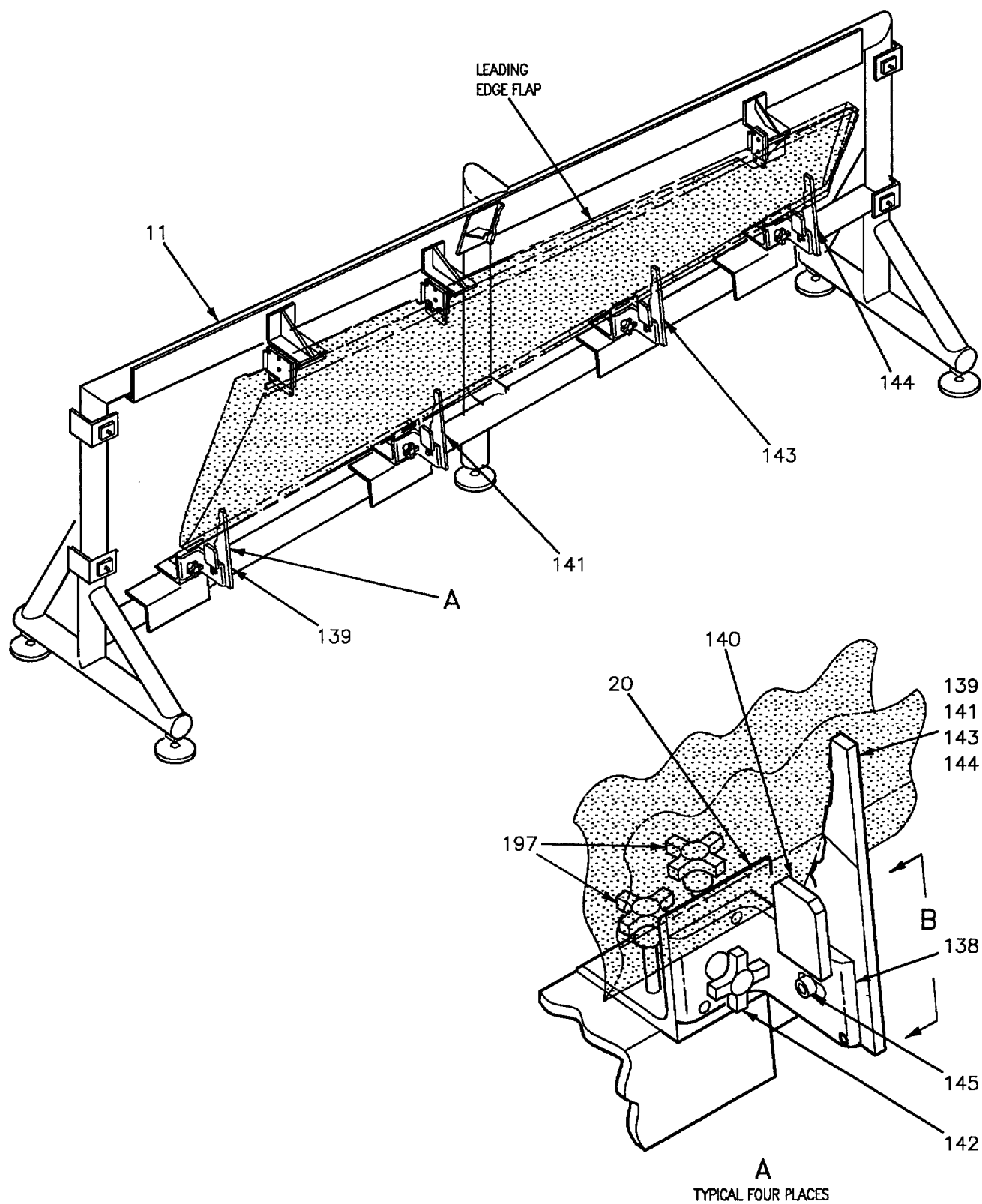
c. With contour boards (details 139, 141, 143, and 144) retracted, install supports (detail 138) to brackets (detail 20) using hand knobs (detail 142), view A.

d. Slide contour boards (details 139, 141, 143, and 144) next to flap, contacting flap on upper mold line at two places, view B.

e. Tighten hand knobs (detail 146), view B.

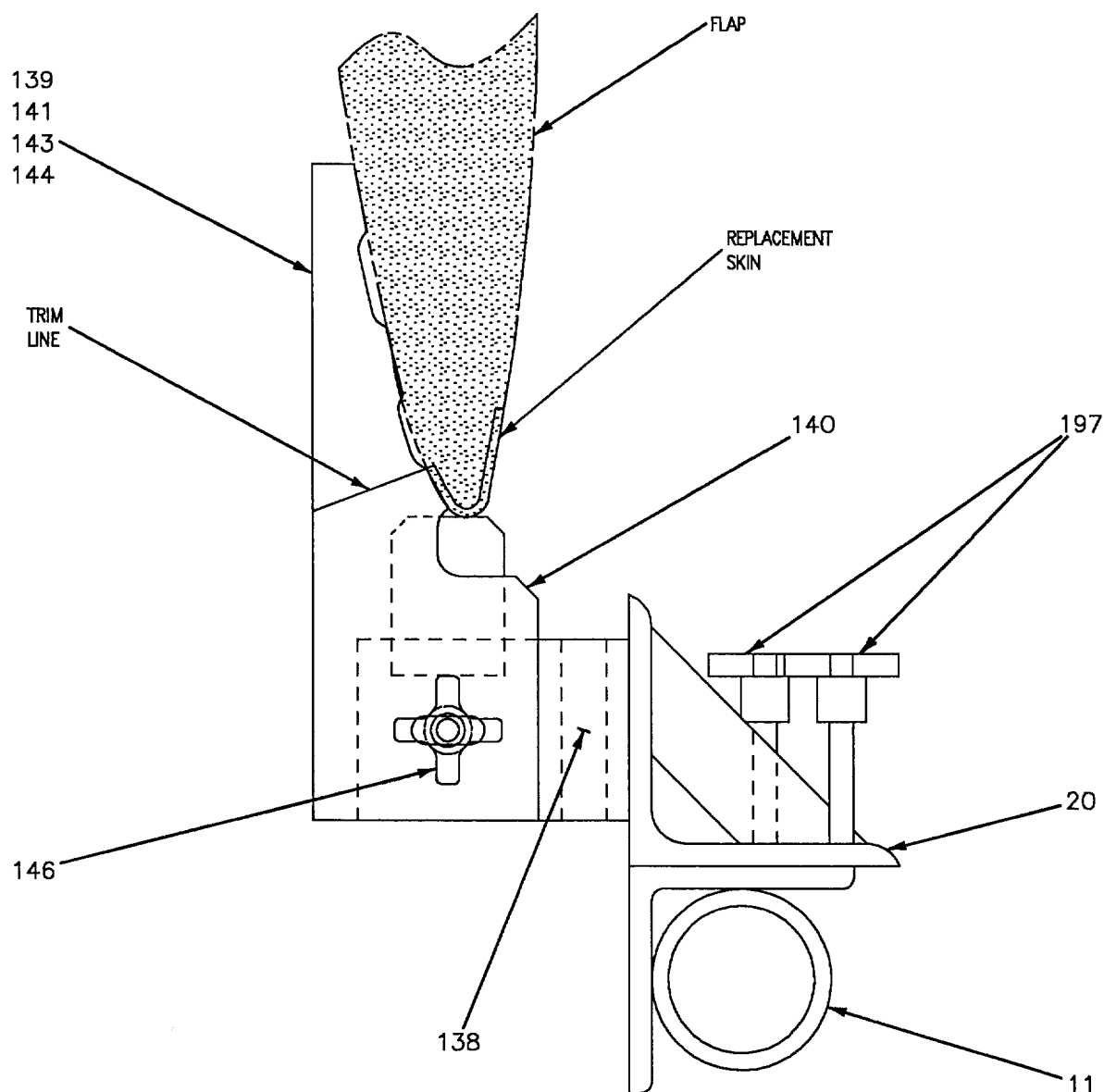
f. Locate replacement skin so that it contacts contour boards (details 139, 141, 143, and 144) for upper mold line, and locators (detail 140) for leading edge of skin, view B.

g. Inspect for trim line on contour boards (details 139, 141, 143, and 144) and scribe trim line on replacement skin, view B.



16050501

Figure 5. Installation of Leading Edge Skin (Sheet 1)



B
TYPICAL FOUR PLACES

Figure 5. Installation of Leading Edge Skin (Sheet 2)

Detail No.	Name	Function
11	Frame	Main support for all details.
20	Bracket	Attaches details to frame (detail 11).
138	Support	Supports contour boards on fixture.
139, 141, 143, 144	Contour Board	Aligns flap and leading edge skin.
140	Locator	Locates leading edge skin for forward position.
142	Hand Knob	Secures brackets (detail 138) to supports (detail 20).
145	Socket Head Shoulder Screw	Attaches hand knob (detail 146).
146	Hand Knob	Secures contour boards for flap assignment.
197	Hand Knob	Secures brackets (detail 20) to frame (detail 11).

Figure 5. Installation of Leading Edge Skin (Sheet 3)

10. ALIGNMENT AND DRILLING FOR RIGGING RIVET. See figure 6.

Support Equipment Required

None

Materials Required

None

a. With flap installed in fixture per paragraph 3, remove L-pins (detail 169) from locators (details 101, 102, and 103) at each hinge point, view A.

b. Remove all details or clamps that would restrict flap from swinging freely on shoulder bolts (detail 165), view A.

c. Retract contour board (detail 136) to open position on contour board (detail 135) by removing L-pin (detail 132), view B.

d. Attach contour board (detail 135) to fixture using L-pins (detail 132) and hand knobs (detail 129), view B.

e. Swing contour board (detail 136) to closed position and pin in place using L-pin (detail 132), view B.

f. Locate 0.250 thickness gages between flap upper and lower mold line, and contour boards (details 135, and 136), view C.

g. Secure flap in place, maintaining 0.250 gap on both sides, by turning thumb screws (detail 134), view C.

h. Attach support (detail 171) to bracket (detail 20) using hand knob (detail 142), view D.

i. Insert traveler bushing (detail 201) into bushing (detail 115) in locator (detail 116), view D.

j. Drill 0.125 diameter hole and install rivet.

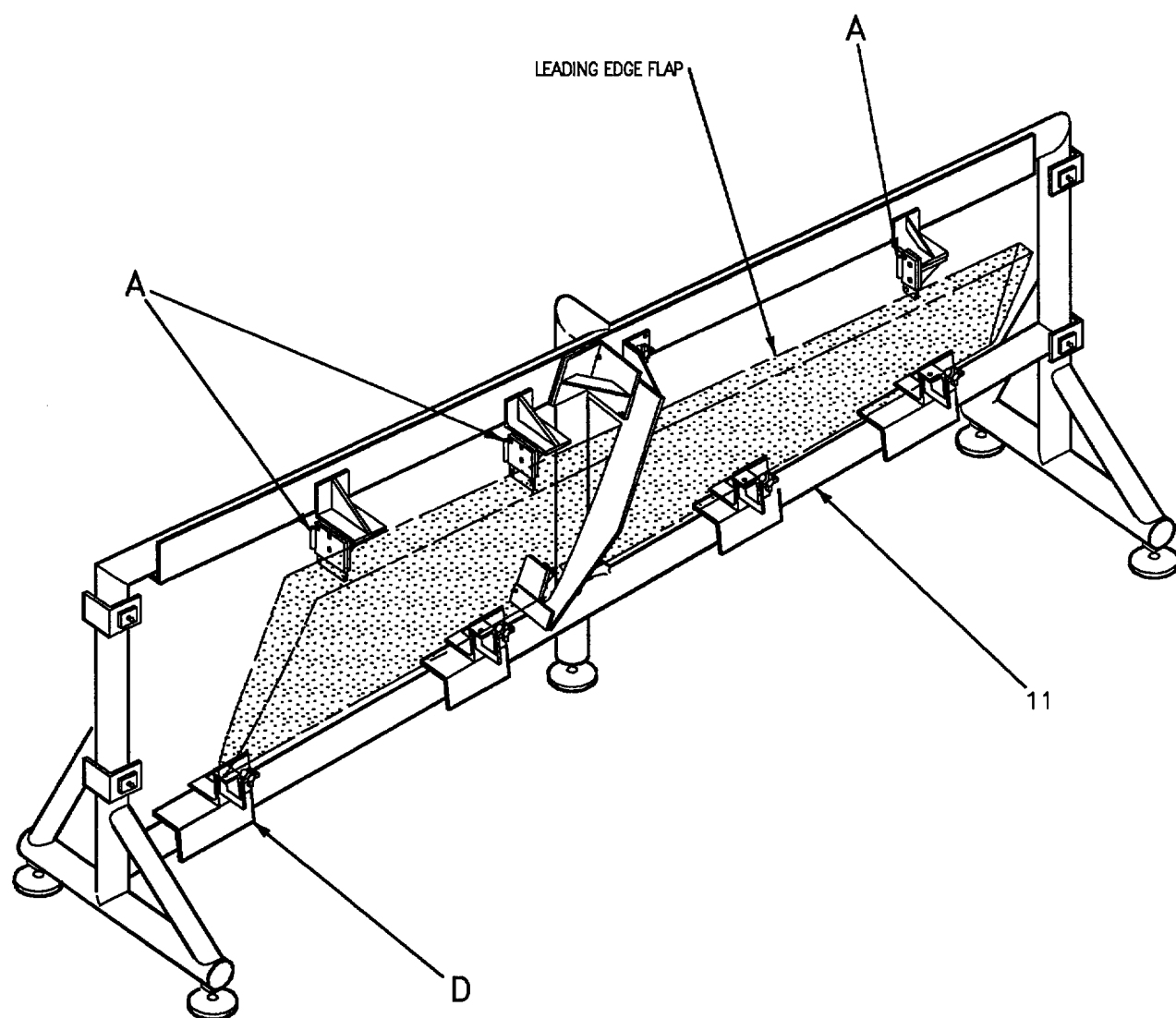


Figure 6. Alignment and Drilling for Rigging Rivet (Sheet 1)

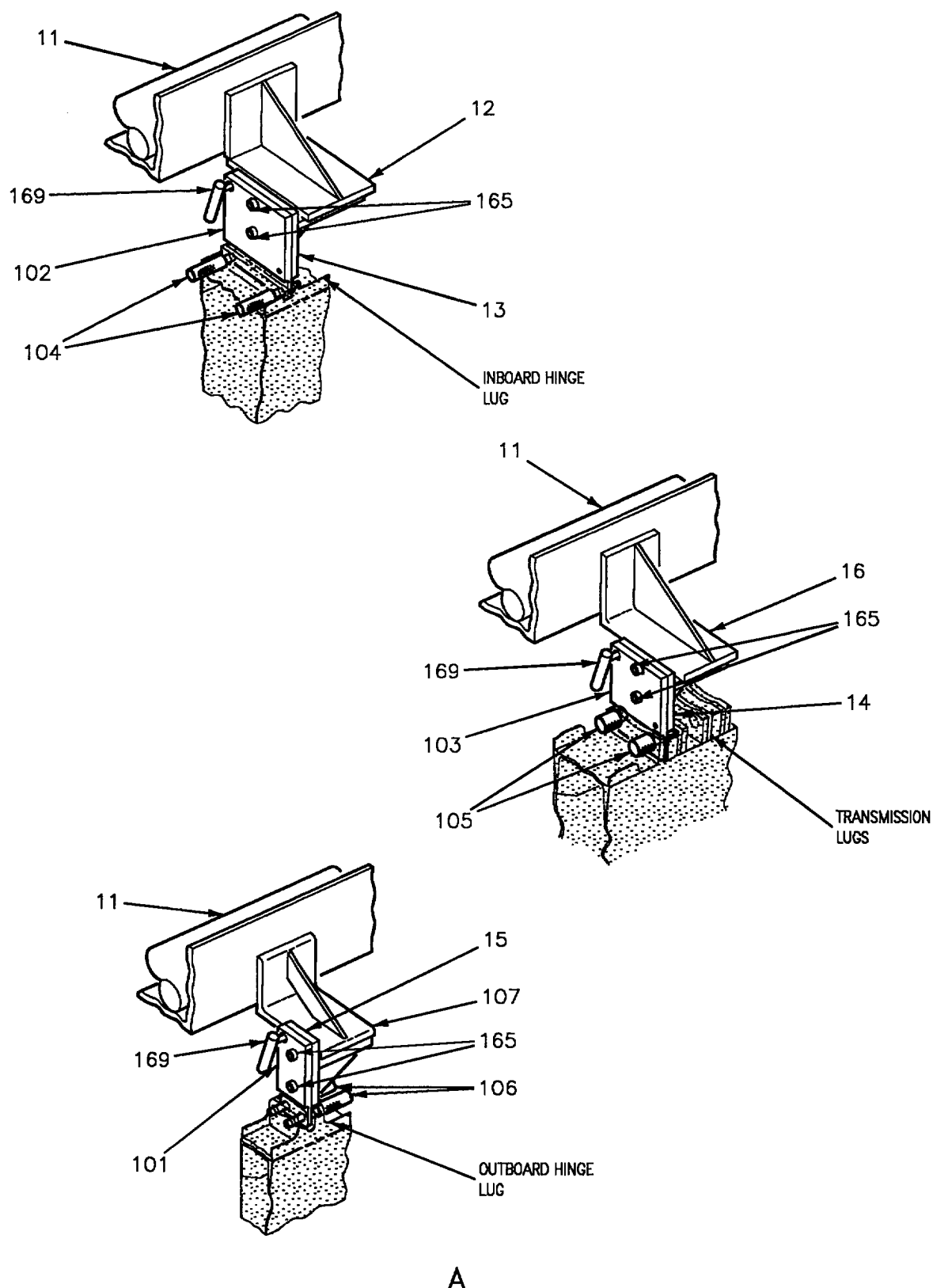


Figure 6. Alignment and Drilling for Rigging Rivet (Sheet 2)

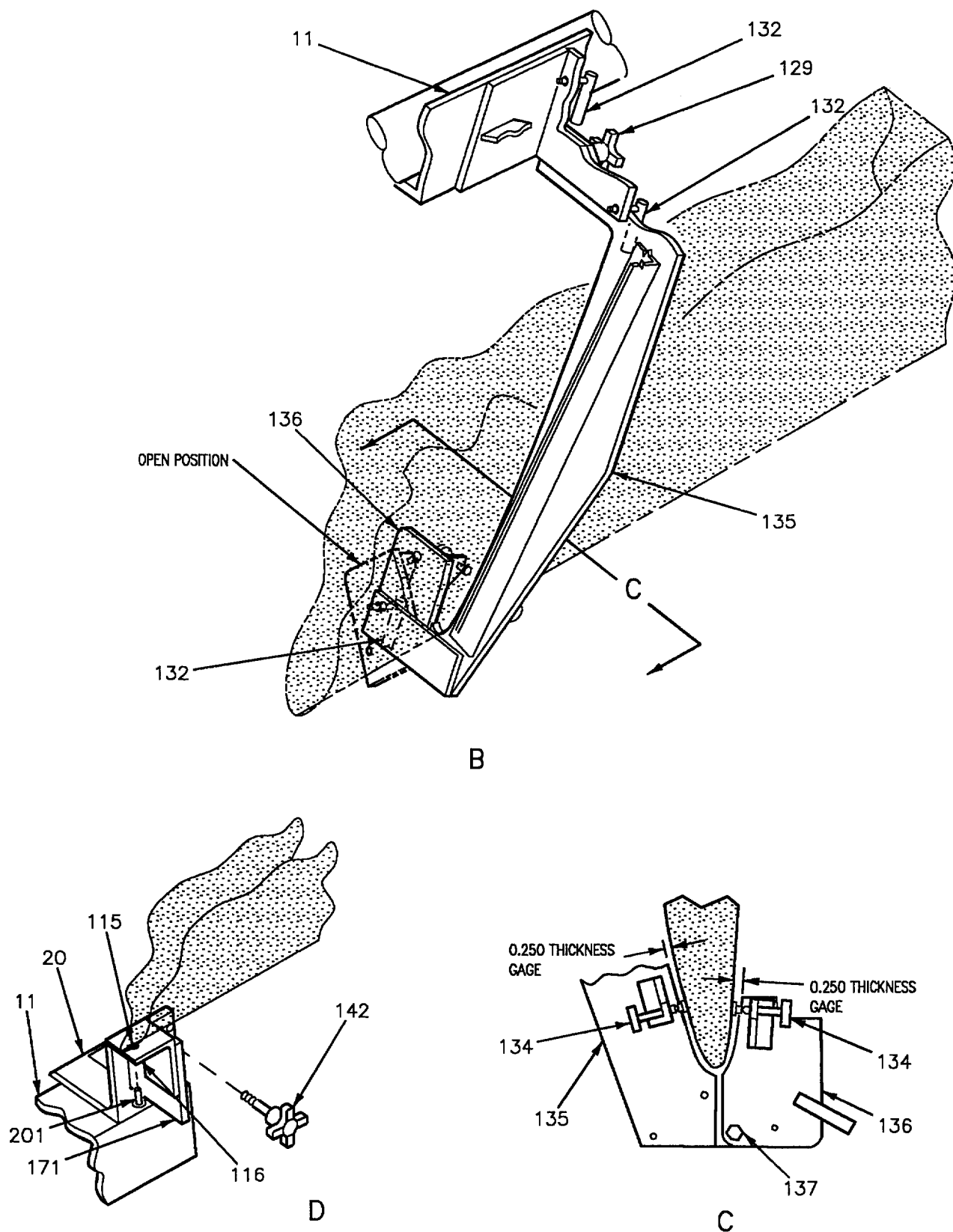


Figure 6. Alignment and Drilling for Rigging Rivet (Sheet 3)

Detail No.	Name	Function
11	Frame	Main support for all data.
12, 16	Support	Supports locators for pinning flap.
3	Locator	Locates detail for pinning flap at inboard lugs.
14	Locator	Locates details for pinning flap at transmission lugs.
15	Locator	Locates detail for pinning flap at outboard hinge lugs.
20	Bracket	Attaches details to frame (detail 11).
101	Locator	Locates detail for installing flap at outboard hinge lugs.
102	Locator	Locates detail for installing flap at inboard hinge lugs.
103	Locator	Locates detail for installing flap at transmission lugs.
104	Pin	Pins flap in fixture at inboard hinge lugs.
105	Pin	Pins flap in fixture at transmission lugs.
106	Pin	Pins flap in fixture at outboard hinge lugs.
107	Support	Supports locator for pinning flap.
115	Drill Bushing	Guides drill for rigging rivet hole.
116	Locator	Locates drill bushing (detail 115) for rigging rivet drilling.
129	Hand Knob	Secures contour board (detail 135) to frame (detail 11).
132	L-Pin	Locates and attaches contour board (detail 135) to frame (detail 11).
134	Thumb Screw	Adjusts and secures flap for alignment for rigging rivet.
135	Contour Board	Locates upper mold line for alignment of rigging rivet.
136	Contour Board	Locates lower mold line for alignment of rigging rivet.
137	Pivot Pin	Hinge point for contour board (detail 136) rotation.
142	Hand Knob	Secures support (detail 171) to frame (detail 11).

Figure 6. Alignment and Drilling for Rigging Rivet (Sheet 4)

Detail No.	Name	Function
165	Shoulder Bolt	Attaches various details to fixture for flap installation and adjustment.
169	L-Pin	Locates various details for pinning flaps at hinge and transmission lugs.
171	Support	Supports locator (detail 116) for alignment of rigging rivet.
201	Traveler Bushing	Guides drill for 0.125 rigging rivet hole.

Figure 6. Alignment and Drilling for Rigging Rivet (Sheet 5)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

WING INTERNAL DOORS

Reference Material

Structure Illustrated Parts Breakdown - Wing	A1-F18AC-SRM-410
Structure Assembly, Wing Inner	FIG013 00
Structure Repair, General Information	A1-F18AC-SRM-200
Introduction	WP002 00
Aircraft Weapons System Cleaning and Corrosion Control	NAVAIR 01-1A-509

Alphabetical Index

Subject	Page No.
Damage Evaluation	1
Negligible Damage	1
Repairable Damage	1
Repairs	2
Replacement	6

Record of Applicable Technical Directives

None

Support Equipment Required

None

Materials Required

None

1. **DAMAGE EVALUATION.** See figures 1 and 2.

2. Damage is classified as negligible and repairable. The types of materials used are shown in figure 1. Repair zones are shown on figure 2. Allowable damage limits within repair zones are listed in table 1 and 2. Locating and determining size of damage by visual method is organizational maintenance. Damage not listed or exceeding the limits listed below requires a depot engineering disposition.

3. **NEGLIGIBLE DAMAGE.** Negligible damage is damage that may be allowed to exist as is. However, preventive maintenance, for temporary corrosion arrestment, should be done to scratches (NAVAIR 01-1A-509). The types and limits of damage are listed below and in table 1. The figure and index numbers in table 1 coincide with the figure and index numbers in the material index.

a. Scratches are not allowed within one diameter from the edge of any hole.

b. Smooth dents only, effective diameter at least 20 times the depth.

4. **REPAIRABLE DAMAGE.** The types and limits of damage are listed below and in table 2. The figure and index numbers in table 2 coincide with figure and index numbers in the material index figure 1.

NOTE

The limits in table 2 apply after blending the damage.

a. Scratches.

(1) Any scratches within one diameter of any hole must be blended out. Minimum blend out is one diameter from edge of any hole.

(2) Scratches to be blended out with diameter, or width, at surface at least 20 times the depth.

b. Nicks, gouges, and corrosion to be blended out with diameter, or width, at surface at least 20 times the depth.

c. The maximum depth for any blended surface damage within one diameter of a bolt hole is 0.007.

d. Cracks and holes require an engineering disposition or replacement of cover.



5. REPAIRS.

6. Repairs require a depot engineering disposition.


Table 1. Negligible Damage Limits

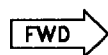
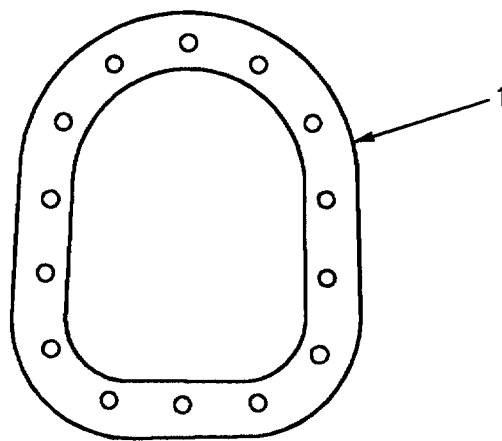
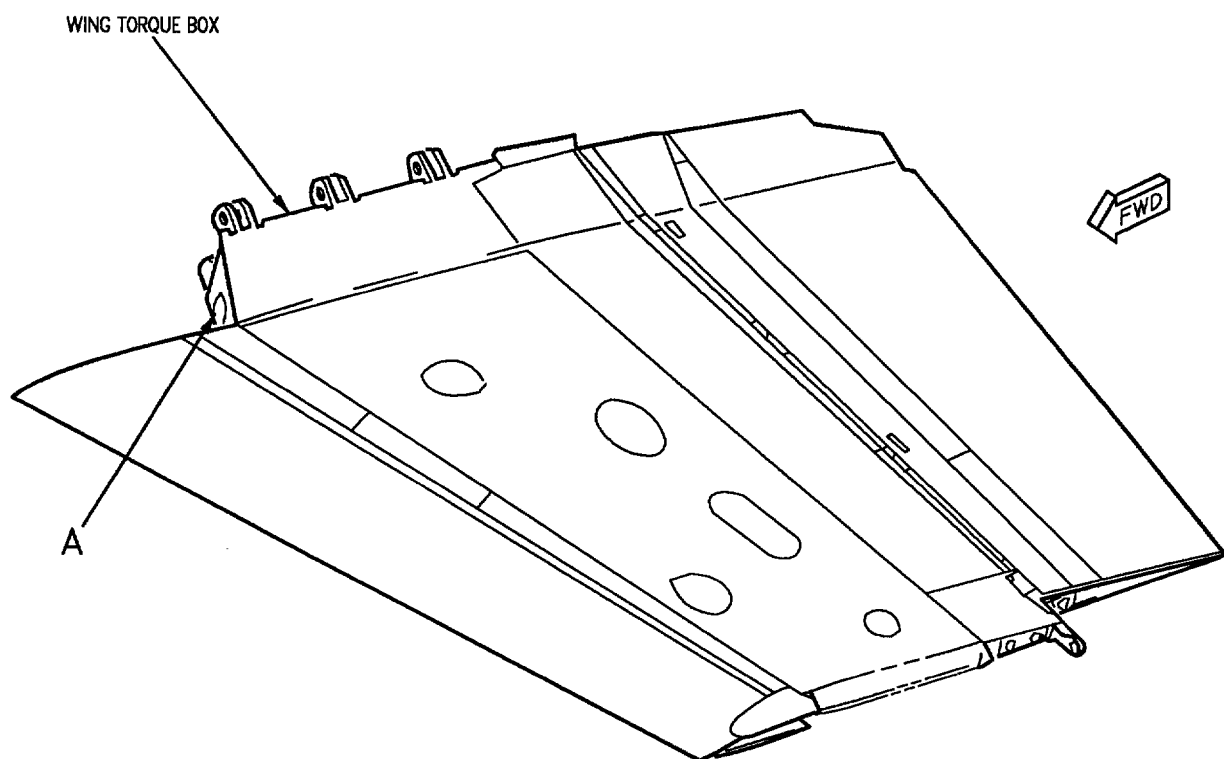
Fig No Idx No	Nomen/ Repair Zone	Thickness	Scratch Depth	Nicks Gouges		Dents Depth	Rivet Tilt
				Depth	Area		
Fig 1(1)	Cover	0.080	0.0006	0.0006	100%	0.020	N/A
	Zone B3 Zone A3	0.125	0.002	0.002	100%	0.020	N/A

Table 2. Repairable Damage Limits After Blending

Fig No Idx No	Nomen/ Repair Zone	Thickness	Edge Nicks Depth	Scratch Depth	Nicks Gouges		Corrosion	
					Depth	Area	Depth	Area
Fig 1 (1)	Cover	0.080	N/A	0.016	0.016	50%	0.016	50%
	Zone B3 Zone A3	0.125	0.060	0.025	0.025	 50%	0.025	 50%

NOTE

 No blending permitted on seal surface. See figure 2.



A

Figure 1. Material Index (Sheet 1)



Idx No.	Eft	Nomenclature and Part No.	Description	Material
1		Cover 74A110850-2005	 0.125 Sheet	7075-T76 Alclad
LEGEND				
 Land is 0.125, bay is 0.080.				

Figure 1. Material Index (Sheet 2)

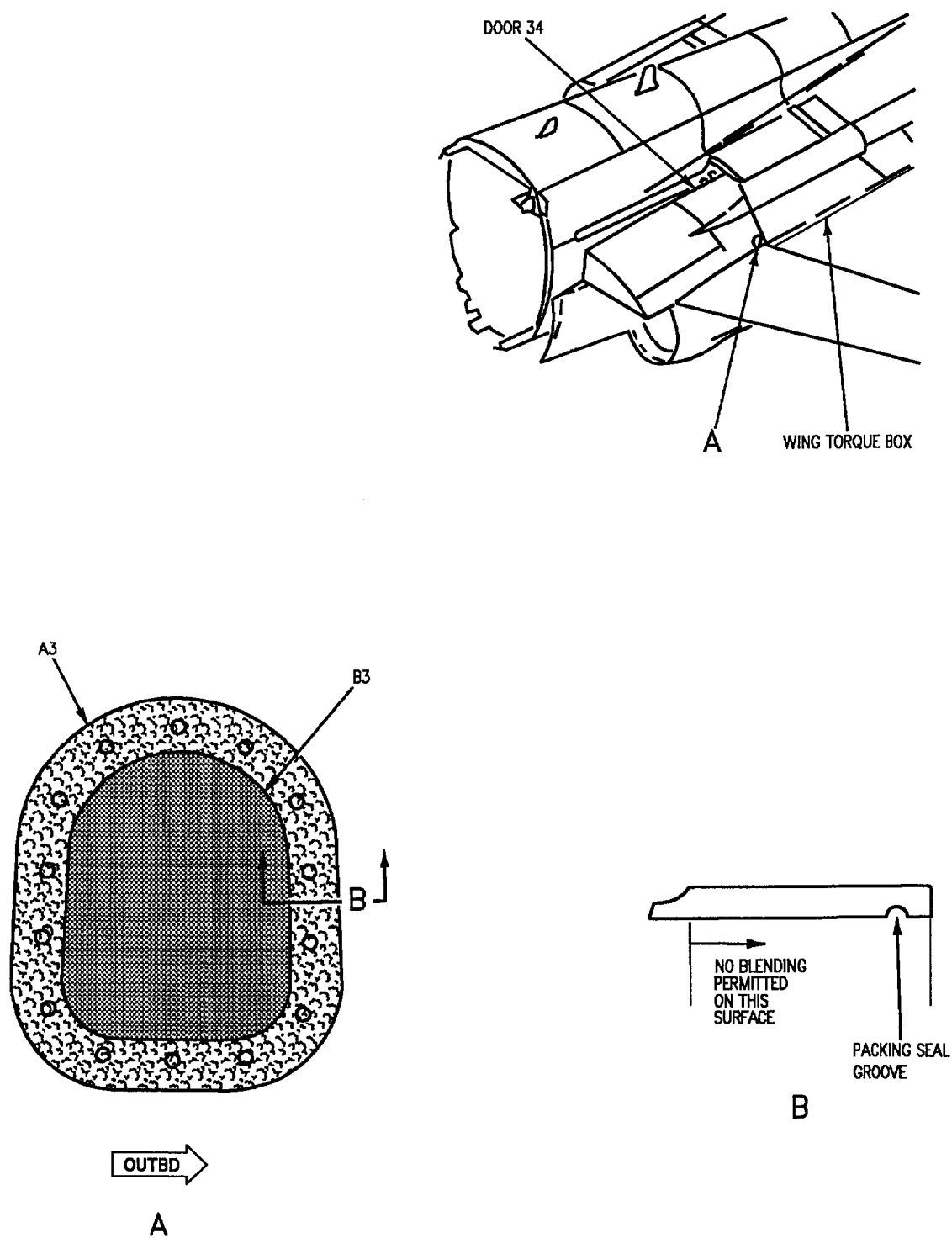


Figure 2. Repair Zones

7. REPLACEMENTS.

8. Fastener attaching hardware is shown for cover as follows:

a. Cover (74A110850) is interchangeable. Fastener attaching hardware is on figure 3. For fasteners (A1-F18AC-SRM-410, FIG013 00).

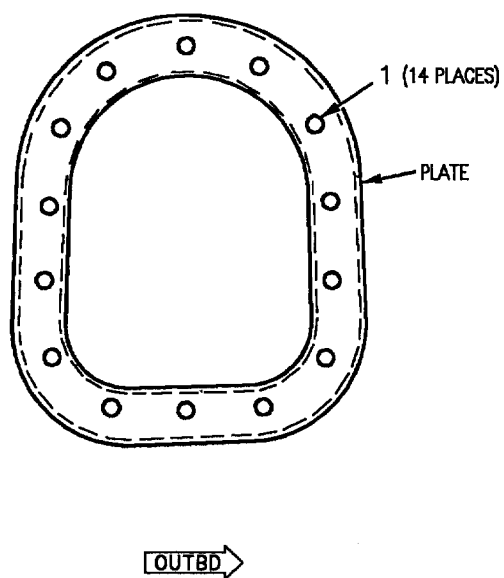


Figure 3. Cover 74A110850 Replacement (Sheet 1)



Idx No.	Eft		Nomenclature	Part Number
1			Plate Plate Nut	74A110934-2001 F49249E-4-2
LEGEND				
 Hole diameter is 0.250 +0.006 -0.000.				

Figure 3. Cover 74A110850 Replacement (Sheet 2)

ORGANIZATIONAL, AND DEPOT MAINTENANCE

STRUCTURE REPAIR

WING FUEL TANK FILLET AND PACKING SEALING PROCEDURES

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Upper Inner Wing Skin Fasteners	WP003 01
Lower Inner Wing Skin Fasteners	WP003 02
Wing Fuel Tank Leak Detection and Isolation	WP026 00
Electrical System	A1-F18AC-420-300
Utility Battery and Charger Unit or Utility Battery	WP019 00
Emergency Battery and Charger Unit or Emergency Battery	WP020 00
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Aircraft Weapons System Cleaning and Corrosion Control	NAVAIR 01-1A-509

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Sealing Compound Removal and Surface Preparation	3

Record of Applicable Technical Directives

None

1. DESCRIPTION.

2. This work package contains instructions for damaged sealing compound removal, area cleaning and touchup, mixing of sealing compound materials, and application procedures to repair a leak. Repairs to fillet seals, if accessible, can be repaired by organizational maintenance. Repairs to fillet seals that are not accessible are depot maintenance.

NOTE

For detection and isolation of fuel leak (WP026 00).

3. SAFETY PRECAUTIONS.

a. Make sure external electrical and hydraulic power are removed from aircraft, disconnect and tie back leads to utility and emergency batteries (A1-F18AC-420-300, WP019 00 and WP020 00), and a NO POWER placard is over power receptacle.

b. Make sure aircraft is grounded to approved static grounding point before starting any fuel tank maintenance.

c. Make sure all ground support equipment is grounded to approved static grounding points before starting any fuel tank maintenance.

d. Make sure radar is not operating in the vicinity of fuel tank maintenance.

e. Make sure enough fire fighting equipment is available.

f. Do not allow smoking within 100 feet of fuel tank maintenance operation.

g. Do not allow operation of aircraft engines and/or spark/heat producing equipment within 50 feet of fuel tank maintenance operation.

h. Do not allow any liquid oxygen operations within 100 feet of fuel tank maintenance operation.

i. Only explosion proof droplights and flashlights are to be used during fuel tank maintenance operation.

j. Any power tools required during fuel tank maintenance must be air driven.

4. DEFINITIONS.

Accelerator - Component added to base compound to get a cured seal.

Activated Sealing Compound - Sealing compound that has had accelerator combined with base compound.

Base Compound - The compound that forms the seal.

Class A Sealing Compound - For brush application.

Class B Sealing Compound - For application by spatula or sealant gun.

Fillet Seal - Laying a continuous bead of class B sealing compound along a seam or joint and working in place with a filleting tool.

Packing Seal - O-ring installed on shank of fastener at countersink to seal fastener hole.

Pot Life - Allowed time to apply activated sealing compound.

Sealing Compound - A mixture of base compound and accelerator that cures to a firm material.

Sealant Gun - A pneumatic or manually operated device used to discharge sealing compound.

5. SEALING COMPOUND REMOVAL AND SURFACE PREPARATION.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Gloves, Toxicological	MIL-G-12223, Type 2
Isopropyl Alcohol	TT-I-735, Grade 1
Rymple Cloth	AMS-3819
Scraper, Wooden or Phenolic	-



Use caution when removing damaged sealing compound to prevent damage to adjacent sealing compound or to underlying structure and its protective coating. Chemical solvents are not recommended because they are difficult to control.

a. Remove damaged sealing compound by cutting or scraping with wooden or phenolic scraper.



Isopropyl Alcohol

4



To avoid contamination, always pour onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Remove final traces of sealing compound by rubbing area with rymple cloth moistened with isopropyl alcohol.

c. Remove dust, chips, and shavings using vacuum cleaner.

d. Wipe area with clean rymple cloth saturated with isopropyl alcohol wipe dry with clean dry rymple cloth before isopropyl alcohol evaporates.

NOTE

Clean an area larger than sealing surface. Do not touch cleaned surface with bare hands.

e. Inspect area for scratches, nicks, or abrasions.

(1) Chemical corrosion treat damage on metal surfaces (NAVAIR 01-1A-509).

(2) Touch up damage to polyurethane corrosion preventive coating.

6. CORROSION PREVENTIVE COATING, MIL-C-27725.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Brushes, Camel Hair	-
Coating, Corrosion Preventive	MIL-C-27725, Type 2, Class B
Gloves, Toxicological	MIL-G-12223, Type 2
Isopropyl Alcohol	TT-I-735, Grade 1
Rymple Cloth	AMS-3819



Corrosion Preventive Coating

9

WARNING

Avoid sparks and open flames during this process. Avoid breathing solvent vapors. Tools used for opening containers and mixing materials shall be spark resistant.

7. The in-tank and faying surfaces of all parts except titanium are spray coated before assembly with MIL-C-27725 coating. Reworked, scratched, or

damaged areas in coating shall be recoated by brush method.

8. **PREPARATION.** MIL-C-27725 coating is available in kit form.



Corrosion Preventive Coating

9

a. Agitate or stir base component thoroughly.

b. Mix correct volume of accelerator to base component per kit instructions while constantly stirring mixture.

NOTE

The activated, mixed sealing compound has a pot life of 8 hours at 77°F and 50 per cent relative humidity.

9. **TOUCH-UP.**



Isopropyl Alcohol

4



To avoid contamination, always pour onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

a. Clean area with clean rymple cloth and isopropyl alcohol.



Corrosion Preventive Coating

9

b. Apply coating to damaged area with brush, feathering coating where it overlaps adjacent coating.

c. Maintain repair coating thickness of approximately 2 mils.

10. RESEALING PROCEDURES.

11. The paragraphs below give correct resealing procedures for wing tanks. When it is determined that a fuel leak requires repair, the determination shall be made whether it is required to defuel the wing tank to safely do repair. Observe all safety precautions. Refer to Safety Precautions, this WP.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Air Pressure Regulator, 0 to 150 psi	-
Sealant Gun, Hand	850
Sealant Gun, Pneumatic	220325
Torque Wrench, 0 to 120 Inch-Pounds	-
Torque Wrench, 0 to 300 Inch-Pounds	-
Torque Wrench, 10 to 750 Inch-Pounds	-

Materials Required

NOTE

Alternate item specifications or part numbers are shown in parentheses.

Nomenclature	Specification or Part Number
Cartridge, Sealing Compound	250-CP6
Cartridge, Sealing Compound	Sem Kit 250-CP6
Petrolatum, Technical	VV-P-236
Packing	SZ7583-8
Packing	SZ7583-10
Packing	SZ7583-12
Packing	SZ7583-14
Sealing Compound	MIL-S-83430 (MIL-S-8802)

12. **SEALING COMPOUND PREPARATION**
MIL-S-83430 OR MIL-S-8802.

13. **Mixing Instructions.** For preparation of sealing compounds sealants (A1-F18AC-SRM-200, WP011 00).

14. **PACKING.** See figure 3. For packing replacement, see table 1. Fasteners installed in non-channel groove area of wing tank or fasteners not protected by a channel groove seal at inner mold line have a pre-formed O-ring packing under the head, view A.



Damage and/or loss of an inaccessible nut may occur if fastener is over-torqued or incorrect fastener length is used.

Be sure to use correct size tip when removing fasteners to avoid damage to fastener head or hole.

a. Remove sealing fastener and retain for reinstallation into same hole.

b. Remove damaged packing from fastener shank or hole countersink.



Prevent damage to new packing during installation on fastener by putting paper cylinder or tape over threads.

c. Install replacement packing on fastener or get replacement fastener assembly, and thread fastener with packing, halfway into hole. For replacement fasteners, (WP003 01 and WP003 02).

NOTE

For alternate packing replacement, replace packing per steps below.

(1) Back fasteners out of hole approximately halfway, or enough to remove damaged packing with a non-metallic removal tool. Do not remove fastener from hole.

(2) Remove damaged packing from hole or shank of fastener over the head of fastener.



Make sure hole and shank are clean of any damaged packing scraps before installing new packing or damage to new packing may occur.

(3) Carefully stretch new packing over head of fastener and seat in place on shank at countersink, view B.

(4) Allow new packing to retract to original size around shank for approximately 1 minute.



Sealing Compound

5



Sealing Compound

10

d. Apply sealing compound to the countersunk head of fastener and packing. Do not apply sealing compound to shank or to countersunk hole, view B.

e. Torque fastener as required below:

(1) 1/4 - inch fastener, 50 to 70 inch-pounds.



(2) 5/16 - inch fastener, 100 to 140 inch-pounds.

(3) 3/8 - inch fastener, 160 to 190 inch-pounds.

(4) 7/16 - inch fastener, 450 to 500 inch-pounds.

f. Smooth sealing compound squeeze-out around fastener head, and fill slot in fastener with excess squeeze-out.

Table 1. Packing/Fastener Combinations

Packing	Fastener 
SZ7583-8	HT271A4 HT4020-4
SZ7583-10	HT271A5 HT4020-5
SZ7583-12	HT271A6 HT4020-6
SZ7583-14	HT271A7 HT4020-7
NOTE  Length of fastener not shown.	

15. **FILLET SEALING.** See figure 1. Damaged and accessible fillet seal areas inside wing tank shall be resealed. For sealant application, fillet seal (A1-F18AC-SRM-200, WP011 00).

16. **PREPARATION OF SEALANT GUNS.** See figure 2.

17. Pneumatic Sealant Gun.



Sealing Compound

5



Sealing Compound

10

a. Install handpacked sealing compound cartridge or prepacked Sem kit sealing compound cartridge in pneumatic sealant gun.

b. Install nozzle.

c. Connect hose assembly to pressure regulator.

d. Connect pressure regulator to compressed air source.

e. Adjust pressure regulator from 0 to 100 psi operating range.

f. Trigger pneumatic sealant gun until there is a smooth flow of sealing compound.

g. Apply sealing compound.

18. Hand Sealant Gun.



Sealing Compound

5



Sealing Compound

10

a. Install handpacked sealing compound cartridge or prepacked Sem kit sealing compound cartridge in hand sealant gun.

b. Install nozzle.

c. Trigger hand sealant gun until there is a smooth flow of sealing compound.

d. Apply sealing compound.

19. LEAK CHECK.



Sealing compound must be cured before refueling wing tank. Refueling before sealing compound has cured could cause fuel leaks.

20. If wing tank was defueled to reseat fuel leak, re-fuel tank and inspect for leaks in resealed area.

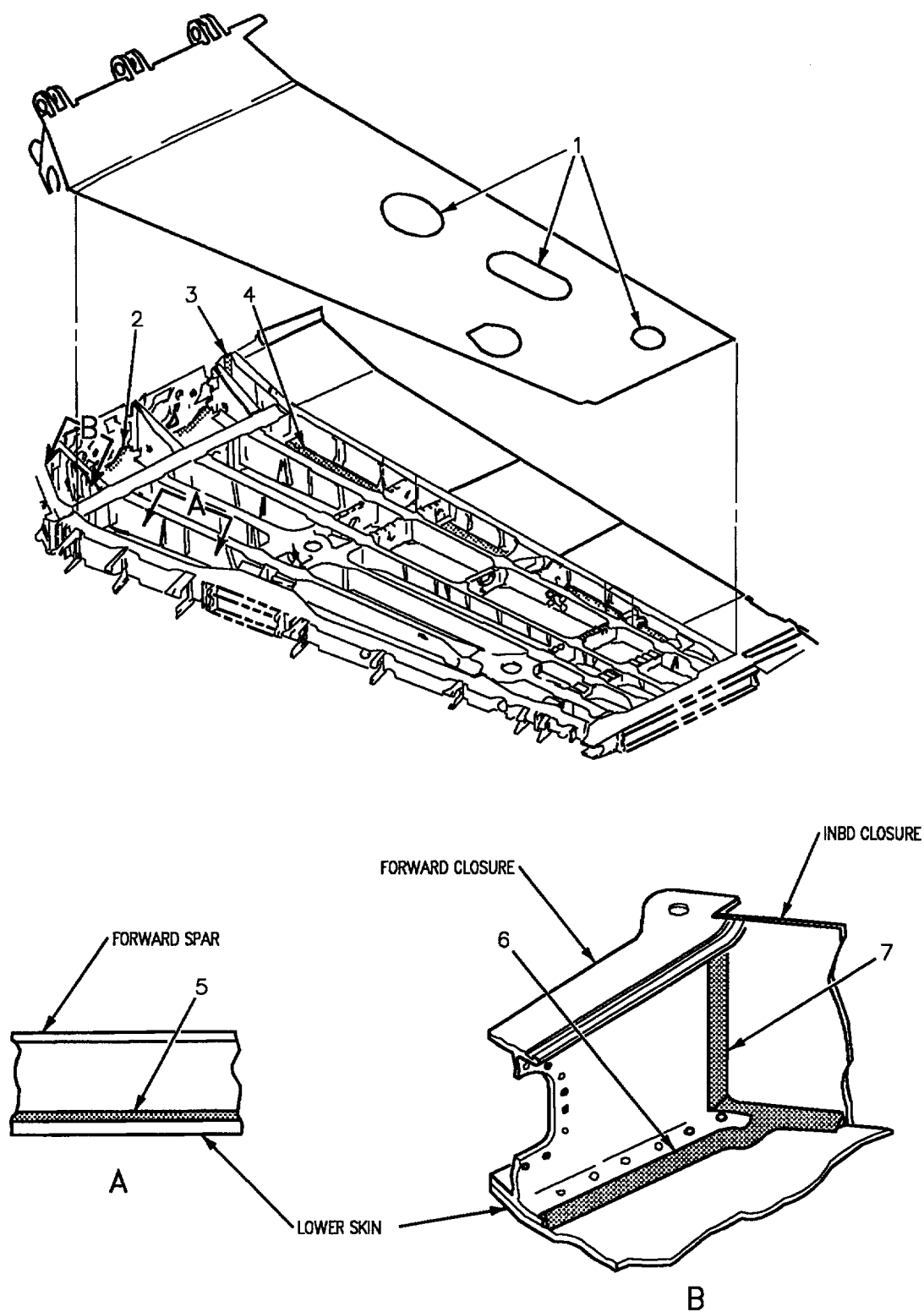


Figure 1. Wing Fuel Tank Sealing (Sheet 1)

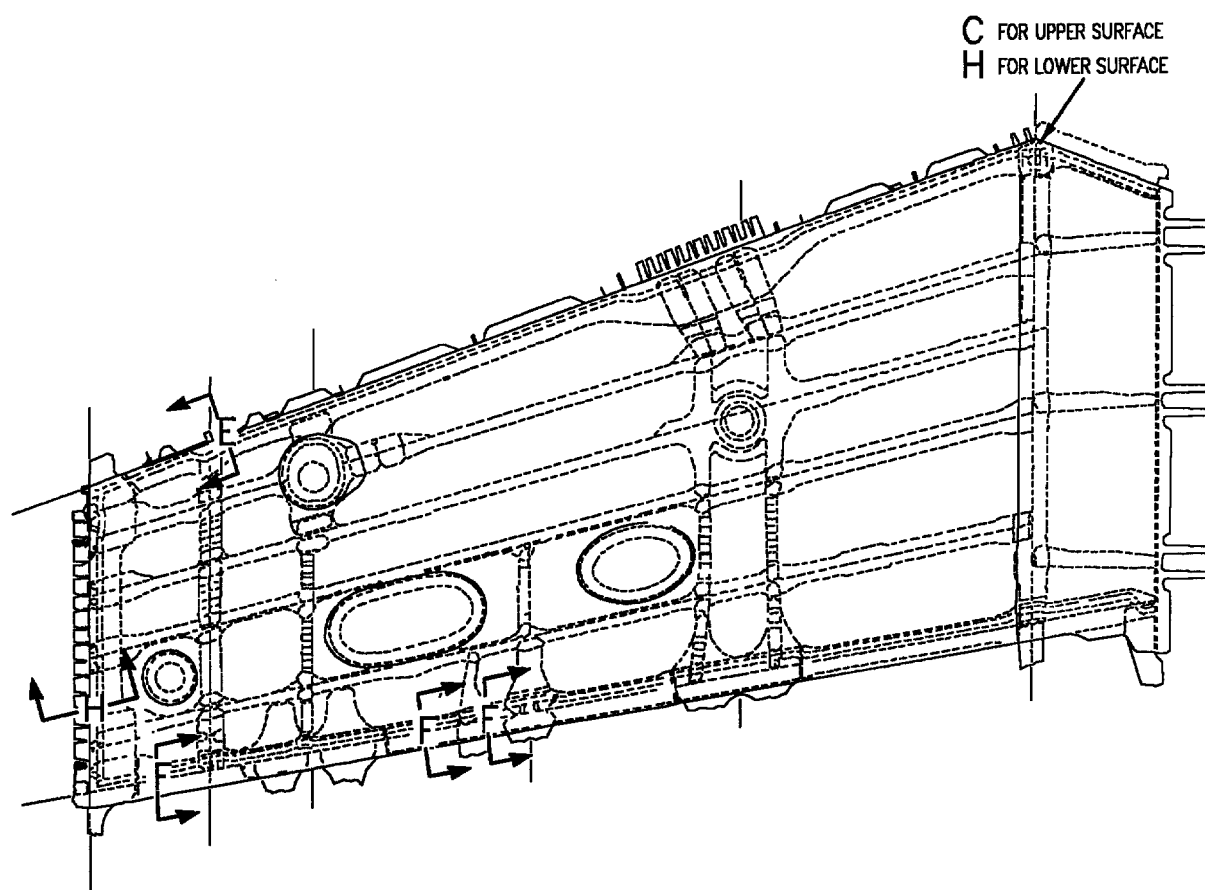


Figure 1. Wing Fuel Tank Sealing (Sheet 2)

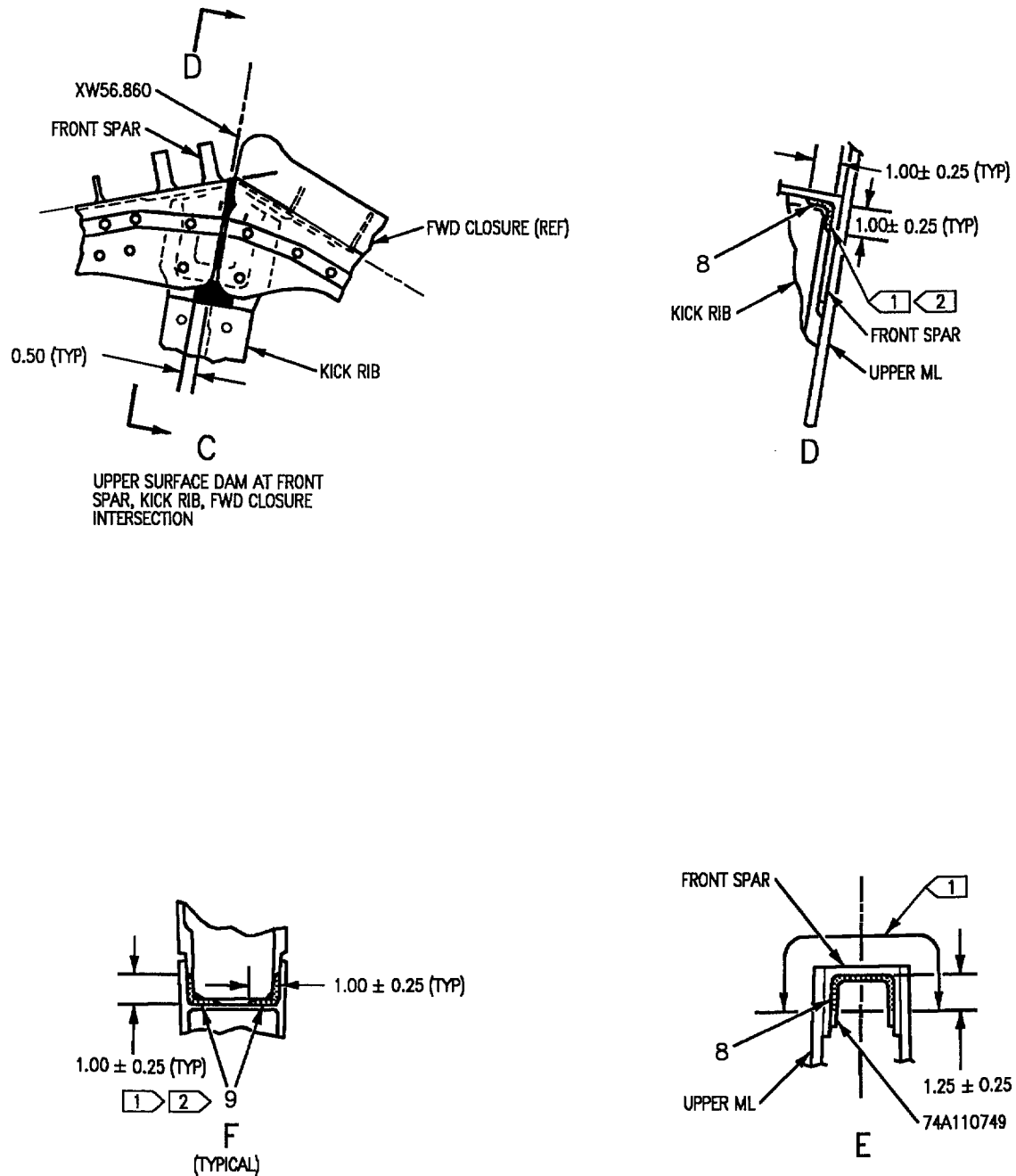


Figure 1. Wing Fuel Tank Sealing (Sheet 3)

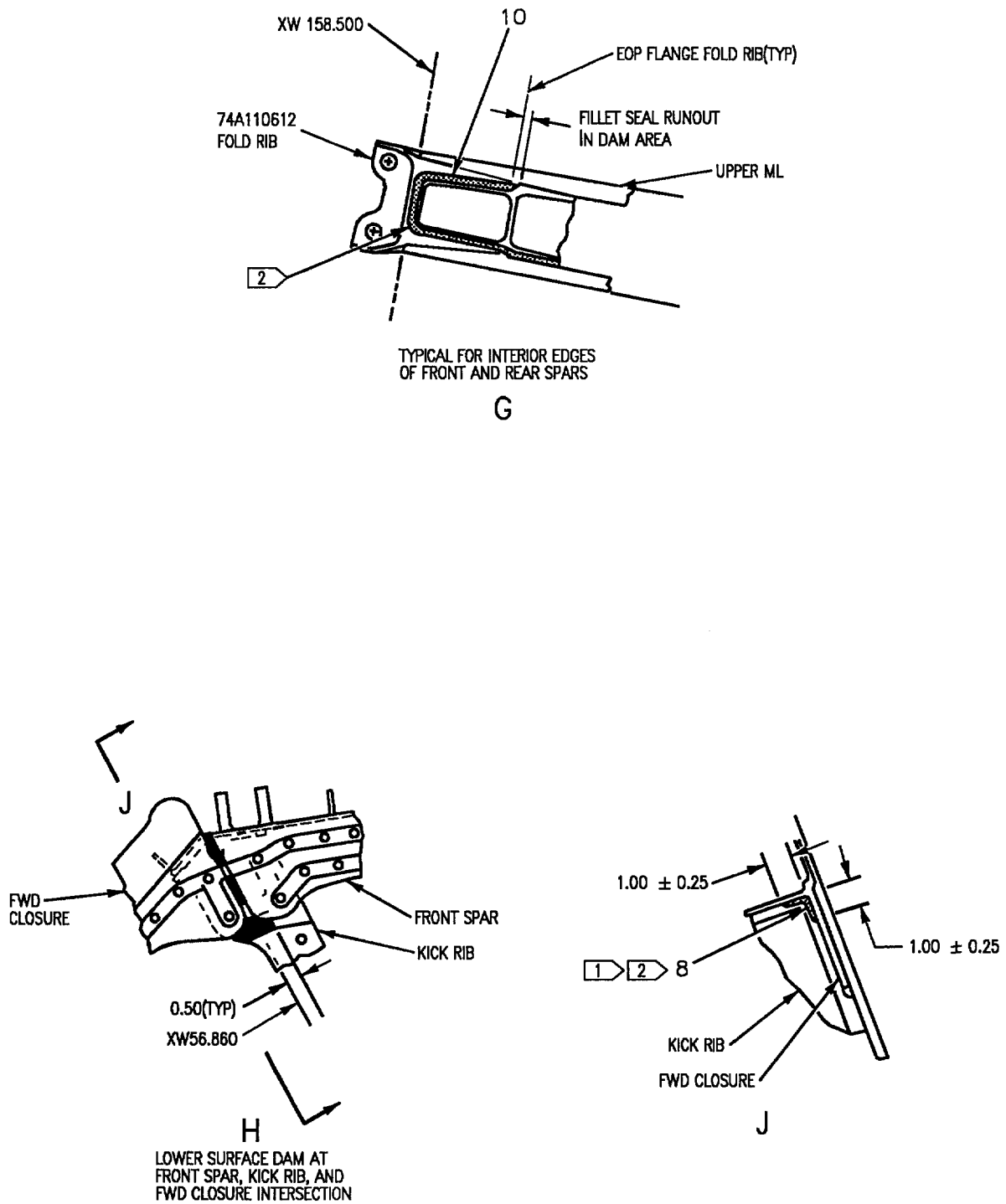


Figure 1. Wing Fuel Tank Sealing (Sheet 4)

LEGEND
 DAM GAP SEAL

 FILLET SEAL

 FILLET SEAL TO DIMENSION SHOWN, BOTH SIDES.

 TO PREVENT INJECTION OF MIL-S-83430 OR MIL-S-8802 SEALANT INTO CHANNEL SEAL GROOVE, PREPACK CHANNEL GROOVE LOCALLY BEFORE FILLET SEALING.

INDEX NO.	NOMENCLATURE	TYPE OF SEAL	SEALANT MATERIAL
1	ACCESS COVERS	GASKET	—
2	INBD CLOSURE TO LOWER SPLICE FITTING	FILLET SEAL	MIL-S-83430 OR MIL-S-8802
3	REAR SPAR INBD END CAP	FILLET SEAL	MIL-S-83430 OR MIL-S-8802
4	REAR SPAR TO LOWER SKIN	FILLET SEAL	MIL-S-83430 OR MIL-S-8802
5	FRONT SPAR TO LOWER SKIN	FILLET SEAL	MIL-S-83430 OR MIL-S-8802
6	FWD CLOSURE RIB TO LOWER SKIN	FILLET SEAL	MIL-S-83430 OR MIL-S-8802
7	FWD CLOSURE RIB INBD END CAP	FILLET SEAL	MIL-S-83430 OR MIL-S-8802
8	74A110749 RIB TO FRONT SPAR	FILLET SEAL	MIL-S-83430 OR MIL-S-8802
9	74A110620, 74A110700, 74A110753 RIBS TO REAR SPAR	FILLET SEAL	MIL-S-83430 OR MIL-S-8802
10	FRONT AND REAR SPAR INTERIOR EDGES TO FOLD RIB	FILLET SEAL	MIL-S-83430 OR MIL-S-8802

Figure 1. Wing Fuel Tank Sealing (Sheet 5)

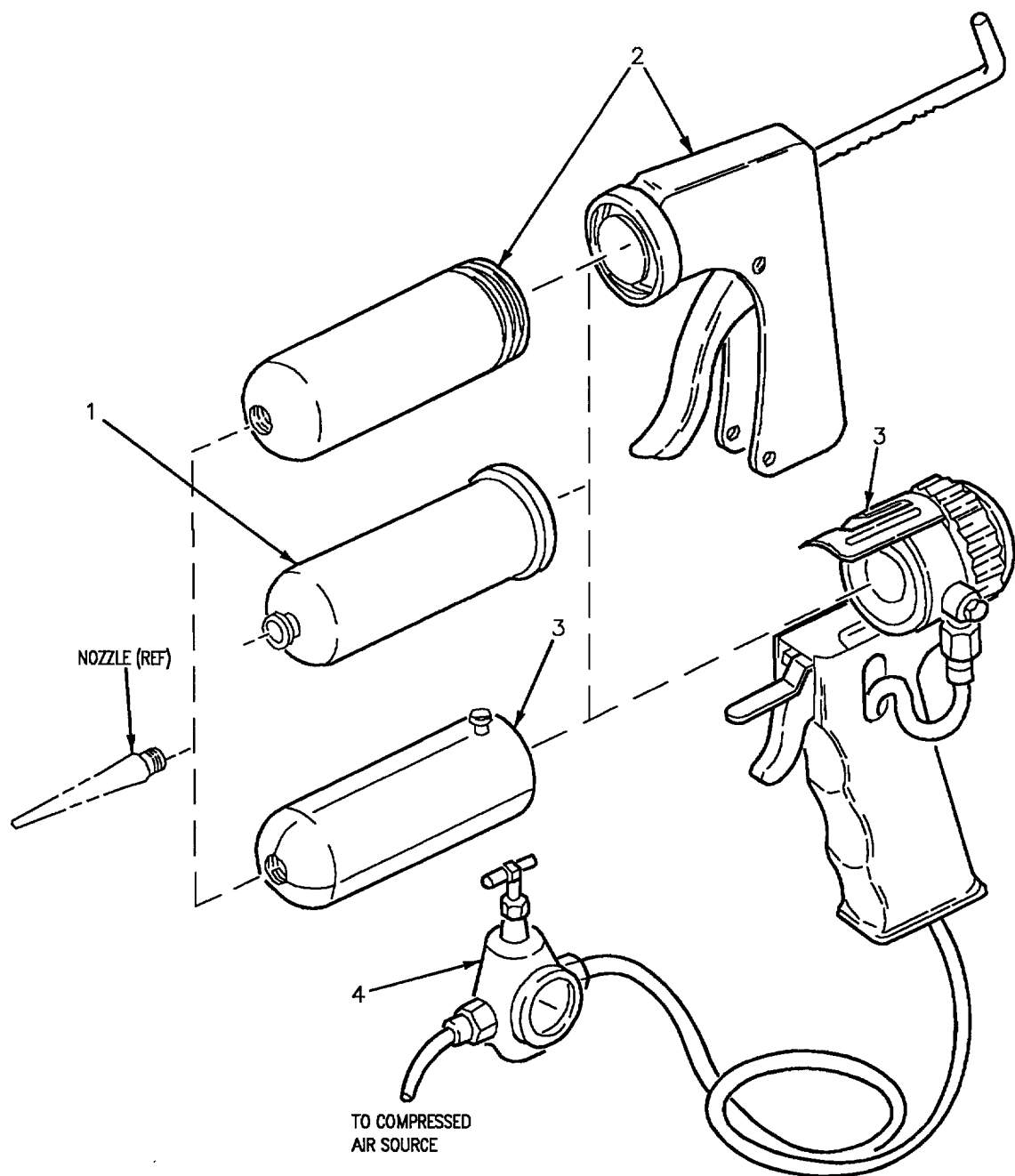
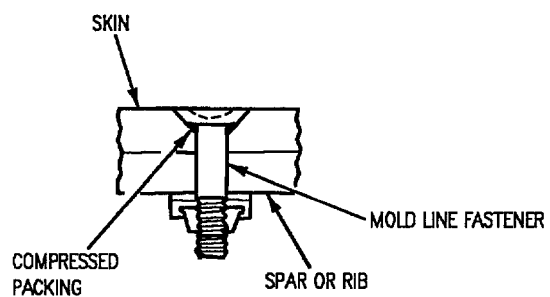
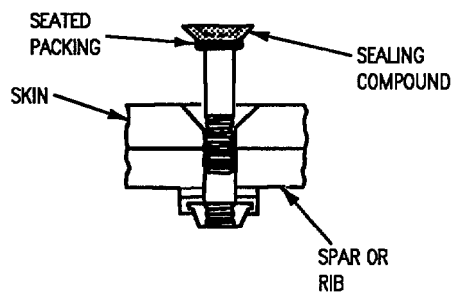


Figure 2. Sealant Gun, Preparation



A



B

Figure 3. Packing Replacement

ORGANIZATIONAL AND DEPOT MAINTENANCE

STRUCTURE REPAIR

WING FUEL TANK DAM GAP SEALS REPAIR

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Wing Internal Doors	WP017 00
Wing Fuel Tank Fillet and Packing Sealing Procedures	WP018 00
Wing Fuel Tank Channel Groove Seal Injection	WP019 00
Wing Fuel Tank Leak Detection and Isolation	WP026 00
Electrical System	A1-F18AC-420-300
Utility Battery and Charger Unit or Utility Battery	WP019 00
Emergency Battery and Charger Unit or Emergency Battery	WP020 00
Integrated Flight Controls	A1-F18AC-570-300
Inboard Flap (84MPU535 or 84MPV536)	WP028 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00

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Record of Applicable Technical Directives

None

1. DESCRIPTION.

2. This work package contains instructions for repair of the wing fuel tank dam gap seals. Dam Gap Seal Locations, See figure 1. If a fuel leak requires repair, the determination shall be made whether to defuel the aircraft to safely do a repair. Observe all safety precautions. Refer to Safety Precautions, this WP.

NOTE

All other resealing procedures should be tried before repairing a dam gap seal (WP018 00 and WP019 00).

For detection and isolation of fuel leak (WP026 00).

Repair of dam gap seals is organizational level maintenance. However, depot level maintenance distance may be required if repair of internal dam gap seals are not within the range of the organizational maintenance crew.

3. SAFETY PRECAUTIONS.

a. Make sure external electrical and hydraulic power are removed from aircraft, disconnect and tie back leads to utility and emergency batteries (A1-F18AC-420-300, WP019 00 and WP020 00), and a NO POWER placard is over power receptacle.

b. Make sure aircraft is grounded to approved static grounding point before starting any fuel tank maintenance (A1-F18AC-PCM-000).

c. Make sure radar is not operating in the vicinity of fuel tank maintenance.

d. Make sure enough fire fighting equipment is available.

e. Do not allow smoking within 100 feet of fuel tank maintenance operation.

f. Do not allow operation of aircraft engines and/or spark/heat producing equipment within 50 feet of fuel tank maintenance operation.

g. Do not allow any liquid oxygen operations within 100 feet of fuel tank maintenance operation.

h. Only explosion proof droplights and flashlights are to be used during fuel tank maintenance operation.

4. DEFINITIONS.

Accelerator - Component added to base compound to get a cured seal.

Activated Sealing Compound - Sealing compound that has had accelerator combined with base compound.

Base Compound - The compound that forms the seal.

Class B Sealing Compound - For application by spatula or sealant gun.

Coupling Agent - Promotes bonding of sealing compound to surfaces.

Dam Gap Seal - Filling of structural gaps and forming of a channel groove with class B sealing compound.

Injection Gun - A pneumatic or manually operated device used to discharge sealing compound.

Pot Life - Allowed time to apply activated sealing compound.

Sealing Compound - A mixture of base compound and accelerator that cures to a firm material.

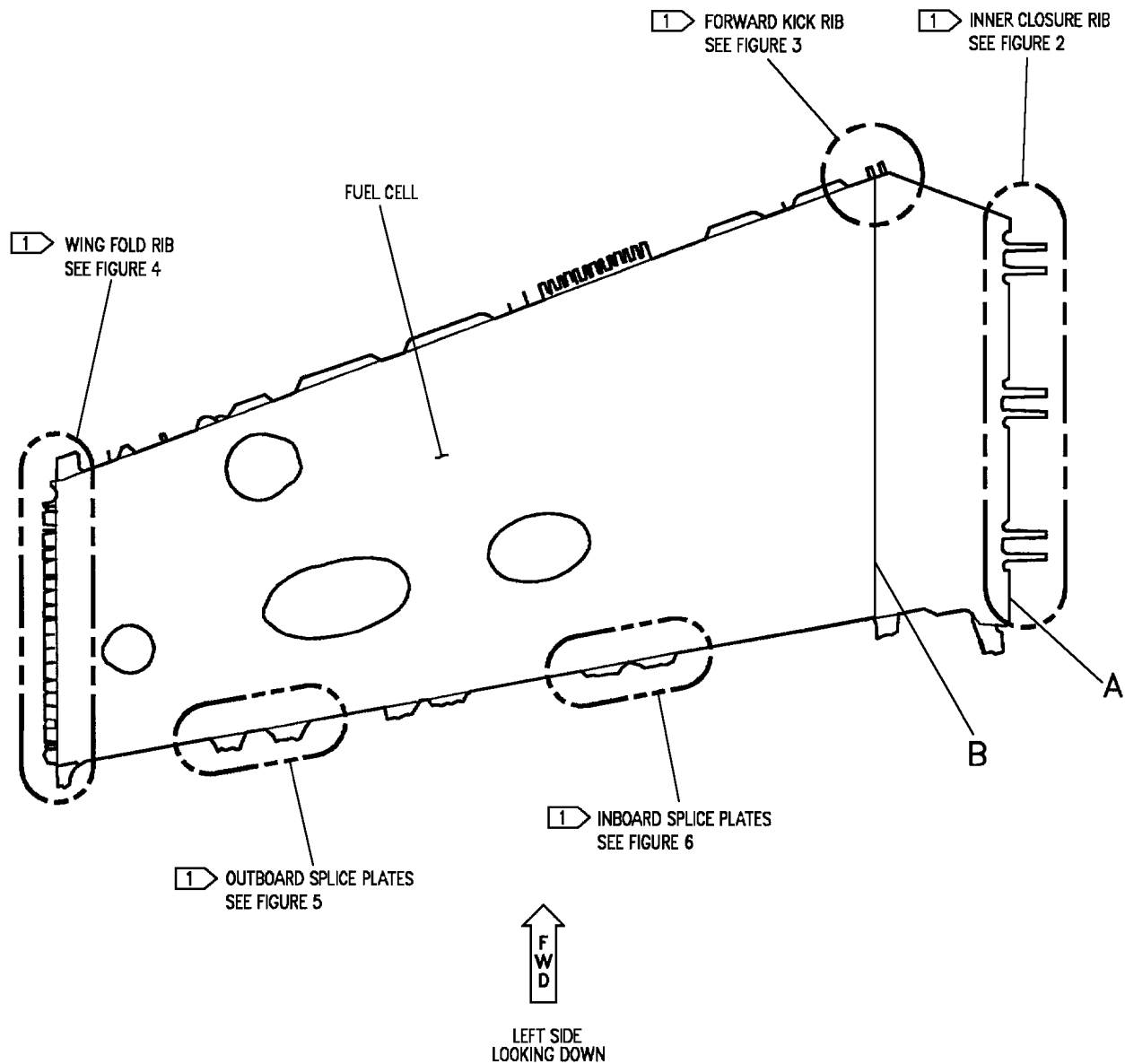
5. **LEAK INSPECTION.** See figure 1 for location of dam gap seals and related repair procedures.

6. If leak continues, despite resealing using other sealing methods, inspect from the exterior of wing for failed dam gap seal as below:

a. Fuel leaking from dam gap seal.

b. Large amount of channel groove sealant escaping from dam gap seal while injecting the channel groove.

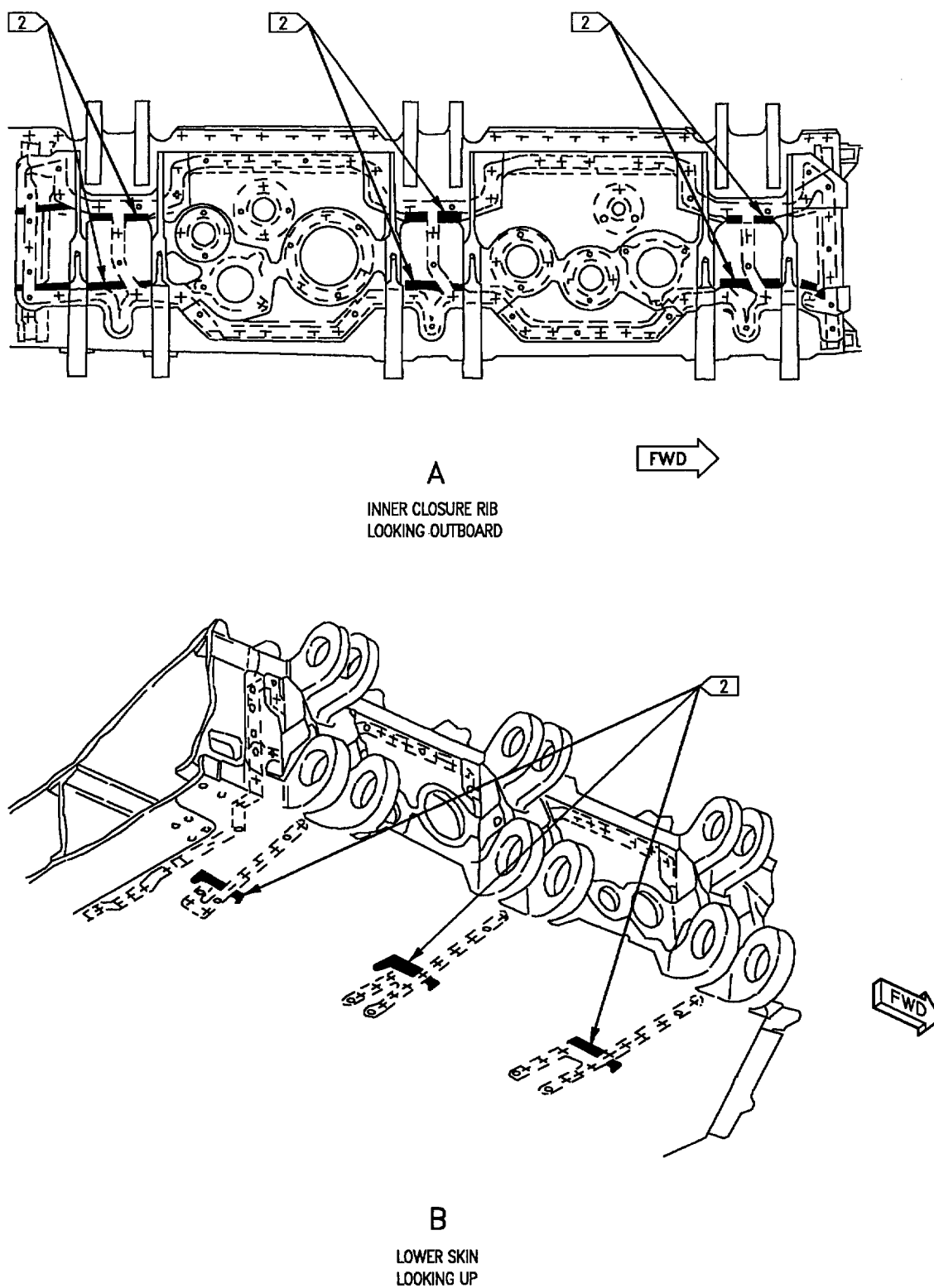
c. Loose or missing dam gap sealant material.



LEGEND

- 1 UPPER AND LOWER DAM GAP SEALS
SEE REFERENCED FIGURES FOR BOTH VIEWS
- 2 NOT ACCESSIBLE INTERNAL DAM GAP SEALS.

Figure 1. Dam Gap Seal Locations (Sheet 1)



7. GENERAL REPAIR PROCEDURE.

8. The steps below are typical for repair of dam gap seals. Refer to Specific Repair Procedures for dam gap seal to be repaired, before continuing with steps below.

Support Equipment Required

None

Materials Required**NOTE**

Alternate item specifications or part numbers are shown in parentheses.

Nomenclature	Specification or Part Number
Applicator, Disposable Brush	6-143 H-T-560
Cleaning Compound	PR146 Blue
Gloves, Toxicological	MIL-G-12223, Type 2
Isopropyl Alcohol	TT-I-735, Grade 1
Nozzle, Injection	Fabricate from SEMCO Nozzle #420 HC2-554025 Type LM Nonmetal Tubing
Nozzle, Injection	TBM-1-8-12
Nozzle, Sealant Gun	420
Pipe Cleaner	840507
Rymple Cloth	AMS-3819
Sealant Removal Tool	Fabricate from 2024-T3 Aluminum Alloy, Bronze Welding Rod, or Steel Welding Rod
Sealing Compound	MIL-S-8340 (MIL-S-8802)
Sponge Stick, Moistener	AA137



Use caution when removing sealing compound to prevent damage to adjacent sealing com-

pound or to underlying structure and its protective coating. Chemical solvents are not recommended because they are difficult to control.

NOTE

A 1/16-inch to 1/8-inch twist drill may be used as a sealant removal tool. Other tools may be fabricated from 2024-T3 aluminum alloy, bronze welding rod, or steel welding rod.

9. FABRICATION OF INJECTION NOZZLE. See Figure 2.

- a. Insert nylon tubing into uncut nozzle until it stops.
- b. Cut off tip of nozzle just in front of tubing not to exceed 1/16 inch.
- c. Insert tubing through nozzle tip. Make sure of tight fit.
- d. Push tubing about halfway through nozzle.



Be careful not to get tubing too close to flame. Tubing will melt.

- e. Hold a flame 1 to 1 1/2 inches below end of tubing, and rotate until end flares.
- f. Pull tubing until flared end seats tightly into nozzle.
- g. Inspect injection nozzle, during use for leaks.

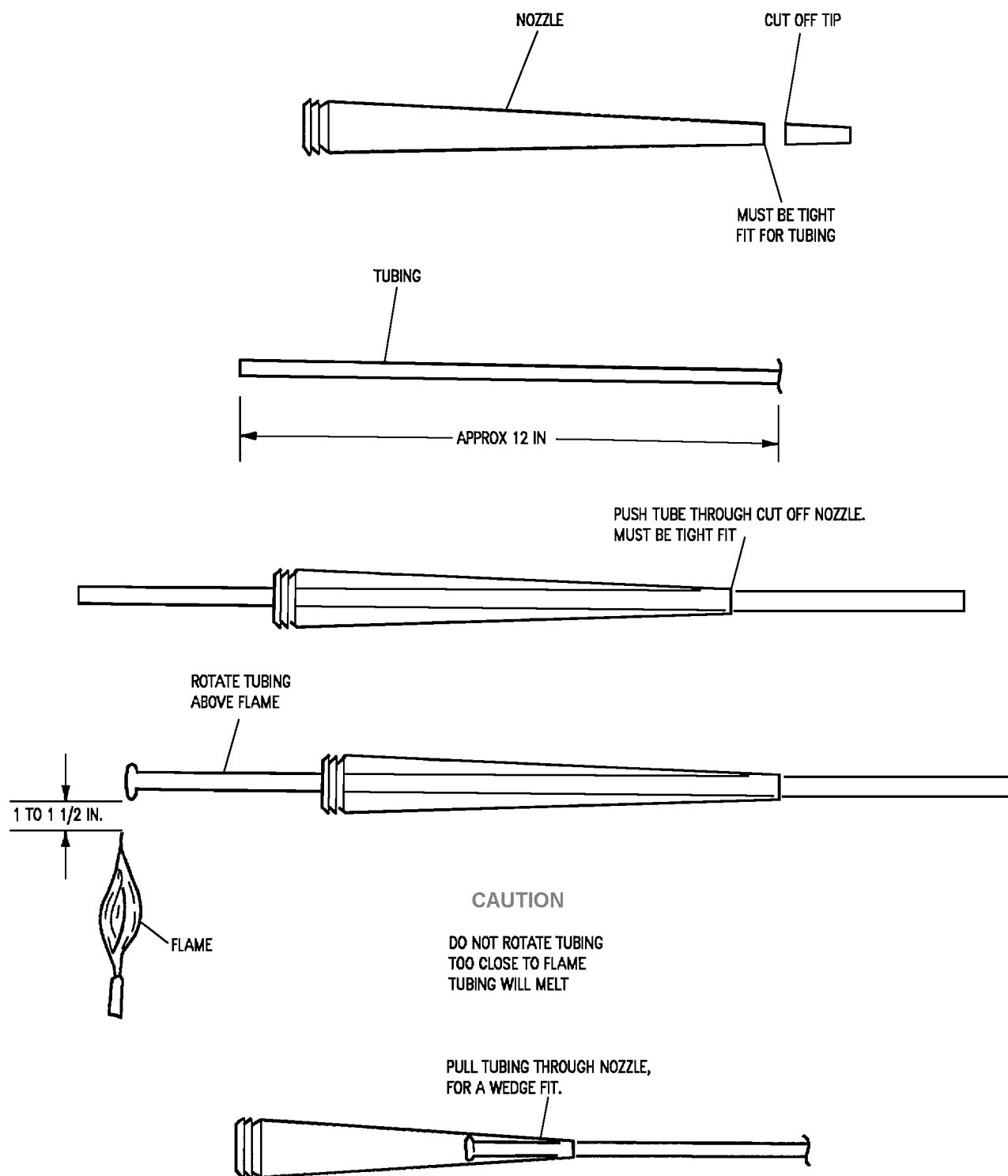


Figure 2. Fabrication of Injection Nozzle

10. **EXTERNAL DAM GAP SEALS.** External dam gap seals are located on the dry, non-fueled side of the channel groove seal.

11. **Resealing.** Resealing of an external dam gap seal is not practical. Rebuild all damaged external dam gap seals as follows:

12. **Rebuild.** The steps below are used to rebuild dam gap seals if required.

a. Remove external part of dam with a sealant removal tool, stopping at channel groove seal.

b. Remove dust, chips and shavings using vacuum cleaner.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

NOTE

Clean an area larger than sealing surface. Do not touch cleaned surface with bare hands.

c. Remove final traces of sealing compound by rubbing area with pipe cleaner, brush, sponge stick, or cloth moistened with isopropyl alcohol.

d. Wipe area with clean pipe cleaner or cloth saturated with isopropyl alcohol, wipe dry with clean, dry pipe cleaner or cloth before isopropyl alcohol evaporates.



Cleaning Compound

8

e. Coat cleaned dam gap area with cleaning compound using disposable applicator or pipe cleaner. Wait 10 to 15 minutes for cleaning compound to dry.

f. Prepare sealing compound and injection gun. Refer to Preparation of Sealing Compound and Injection Gun, this WP.

g. Mark injection nozzle per dimensions in specific repair procedure for dam to be repaired.



Sealing Compound

5



Sealing Compound

10

h. Insert injection nozzle full depth and inject sealing compound while slowly withdrawing the nozzle. Allow sealing compound to protrude past dam gap.

i. Apply a piece of tape over sealing compound if required to help retain sealing compound in dam gap. Remove tape after approximately 1 hour. If dam retainer was removed per specific repair paragraph, reinstall it instead of tape.

NOTE

Curing information in this procedure is for MIL-S-83430 and MIL-S-8802 only. For PR1826 curing information refer to A1-F18AC-SRM-200, WP011 00. Cure of sealing compound can be accelerated by applying heat to 140° F until sealing compound is firm and rubbery. At 140° F, the sealing compound will be firm and rubbery in approximately 1 hour. Do not exceed 140° F as this will cause sealing compound to bubble.

j. Cure sealing compound for 24 hours; additional time will be required below 77° F.



Be sure correct observation bolt is removed before reinjecting a channel groove seal across a repaired dam gap seal or damage may occur to dam gap seal.

NOTE

Slight extrusion of channel groove sealing compound from dam gap seal is allowable.

k. Reinject channel groove sealing compound in area of rebuilt dam gap seal (WP019 00).

13. INTERNAL DAM GAP SEALS. Internal dam gap seals are located on the wet, fueled side, of the channel groove seal. Aircraft must be defueled for this repair.

14. Resealing. Resealing of an internal dam gap seal is not practical. Rebuild all damaged internal dam gap seals as follows:

15. Rebuild. The steps below are used to rebuild dam gap seals.

a. Remove external dam, channel groove, and internal dam sealing compound with a sealing compound removal tool.

b. Remove dust, chips and shavings using vacuum cleaner.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto cleaning materials. Never dip cleaning cloth into isopropyl alcohol.

NOTE

Clean an area larger than sealing surface. Do not touch cleaned surface with bare hands.

c. Remove final traces of sealing compound by rubbing area with pipe cleaner, brush, sponge stick, or cloth moistened with isopropyl alcohol.

d. Wipe area with clean pipe cleaner or cloth saturated with isopropyl alcohol, dry with clean, dry pipe cleaner or cloth before isopropyl alcohol evaporates.



Cleaning Compound

8

e. Coat cleaned internal dam gap area with coupling agent using disposable applicator or pipe cleaner. Wait 10 to 15 minutes for coupling agent to dry.

f. Prepare sealing compound and injection gun. Refer to Preparation of Sealing Compound and Injection Gun, this WP.

g. Mark injection nozzle per dimensions in specific repair procedure for dam to be repaired.



Sealing Compound

5



Sealing Compound

10

h. Insert injection nozzle full depth of internal dam gap and inject sealing compound while slowly withdrawing the nozzle, stopping inner edge of channel groove.

NOTE

Curing information in this procedure is for MIL-S-83430 and MIL-S-8802 only. For PR1826 curing information refer to A1-F18AC-SRM-200, WP011 00. Cure of sealing compound can be accelerated by applying heat to 140°F until sealing compound is firm and rubbery. At 140°F, the sealing compound will be firm and rubbery in approximately 1 hour. Do not exceed 140°F as this will cause sealing compound to bubble.

- i. Cure sealing compound for 24 hours, additional time will be required below 77°F.

NOTE

Allow channel groove sealing compound to extrude from external dam gap.

- j. Reinject channel groove sealing compound in area of rebuilt dam gap seal (WP019 00).

- k. Remove channel groove sealing compound from external dam gap with a sealing compound removal tool up to the outer edge of channel groove. Make sure channel groove sealing compound remains in channel groove.

NOTE

Clean an area larger than sealing surface. Do not touch cleaned surface with bare hands.

- l. Remove final traces of channel groove sealing compound by rubbing area with pipe cleaner, brush, sponge stick, or cloth moistened with isopropyl alcohol.

- m. Wipe area with clean pipe cleaner or cloth saturated with isopropyl alcohol. Wipe dry with clean, dry pipe cleaner or cloth before isopropyl alcohol evaporates.

- n. Coat cleaned dam gap area with coupling agent using disposable applicator or pipe cleaner. Wait 10 to 15 minutes for coupling agent to dry.

- o. Insert ejection nozzle full depth and inject sealing compound while slowly withdrawing the nozzle. Allow sealing compound to protrude past dam gap.

- p. Apply a piece of tape over sealing compound if required to help retain sealing compound in dam gap. Remove tape after approximately 1 hour. If dam retainer was removed per specific repair paragraph, reinstall it instead of tape.

NOTE

Curing information in this procedure is for MIL-S-83430 and MIL-S-8802 only. For PR1826 curing information refer to A1-F18AC-SRM-200, WP011 00. Cure of sealing compound can be accelerated by applying heat to 140°F until sealing compound is firm and rubbery. At 140°F, the sealing compound will be firm and rubbery in approximately 1 hour. Do not exceed 140°F as this will cause sealing compound to bubble.

- q. Cure sealing compound for 24 hours, additional time will be required below 77°F.



Be sure correct observation bolt is removed before reinjecting a channel groove seal across a repaired dam gap seal or damage may occur to dam gap seal.

NOTE

Slight extrusion of channel groove sealing compound from dam gap seal is allowable.

- r. Reinject channel groove sealing compound in area of rebuilt dam gap seal (WP019 00).

16. SPECIFIC REPAIR PROCEDURES.

17. The paragraphs below are procedures for specific dam gap seal areas. Each paragraph will cover steps unique to its designated area. General repair paragraph 7 will be referred to for repair procedures typical for all dam gap seals. See figure 1 for location of dam gap seals and related repair procedures.

18. CLOSURE RIB DAM GAP SEAL REPAIR. See figure 3.**19. Forward Dam Gap Seals.**

- a. Remove access doors 41L (or 41R) and 34L (or 34R) (A1-F18AC-LMM-010).



Aircraft must be defueled before removing dam retainers or internal access cover.

Care should be taken, when removing or installing fasteners, not to over-tighten or use excess force, loss of or damage to an inaccessible nut element may occur.

b. Remove external dam retainer at dam gap seal to be repaired.

c. If removal of internal dam retainer is required for seal repair, remove forward closure rib access cover (WP017 00). For internal dam retainers, view C.

d. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view A.

e. Replace dam gap retainer immediately after re-sealing dam gap.

f. Fillet seal around dam gap retainer for at least 1 inch in all directions from repairs. (A1-F18AC-SRM-200, WP011 00).

g. Refuel aircraft and inspect for leak in repaired dam gap seal. Reinspect after 8 hours or after next flight.

h. Install access doors 41L (or 41R) and 34L (or 34R) (A1-F18AC-LMM-010).

20. Aft Dam Gap Seals.

a. Remove access door 41L (or 41R) (A1-F18AC-LMM-010).

b. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view B.

c. Refuel aircraft and inspect for leaks in repaired dam gap seal. Reinspect after 8 hours or after next flight.

d. Install access door 41L (or 41R) (A1-F18AC-LMM-010).

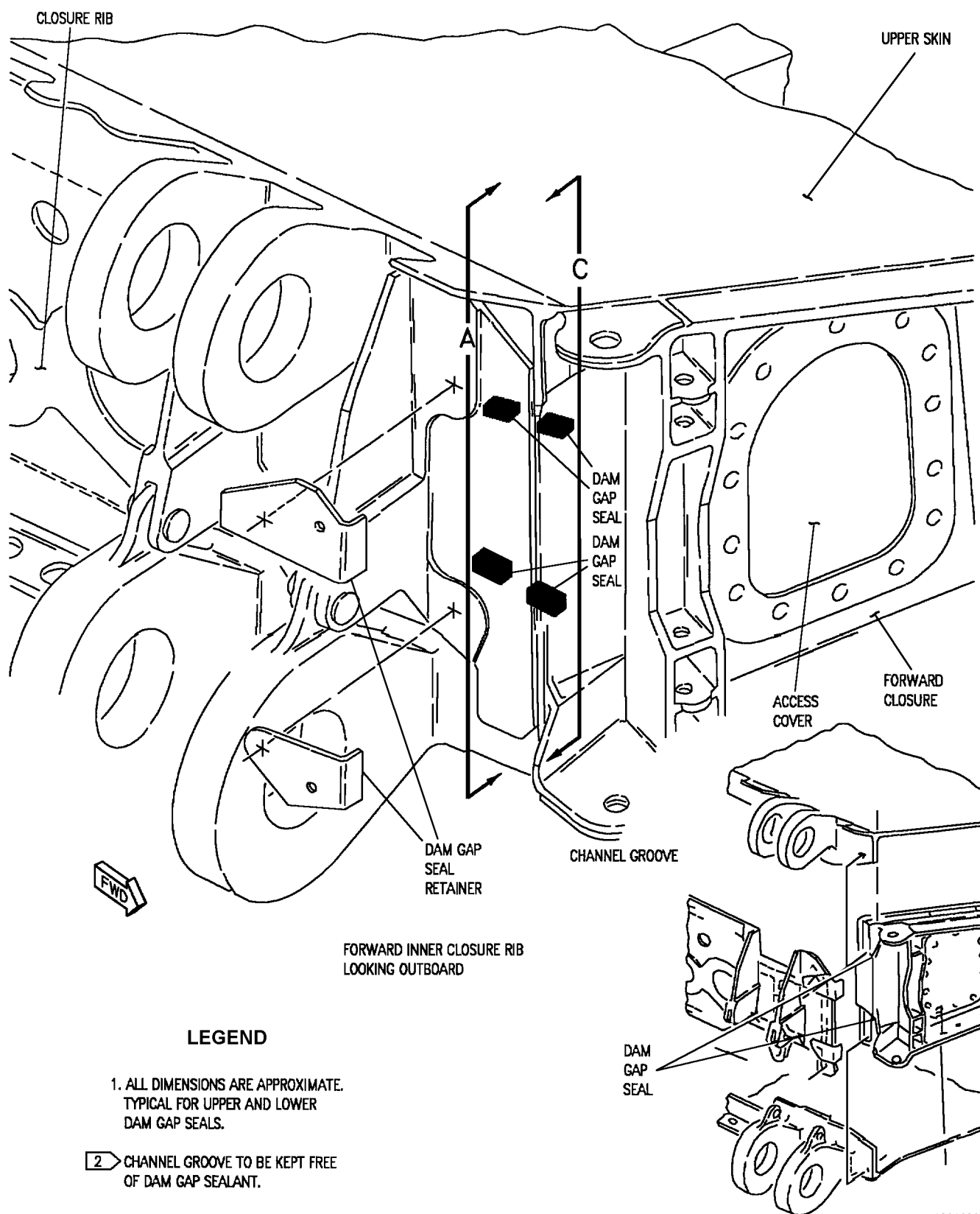


Figure 3. Closure Rib Dam Gap Seal Repair (Sheet 1)

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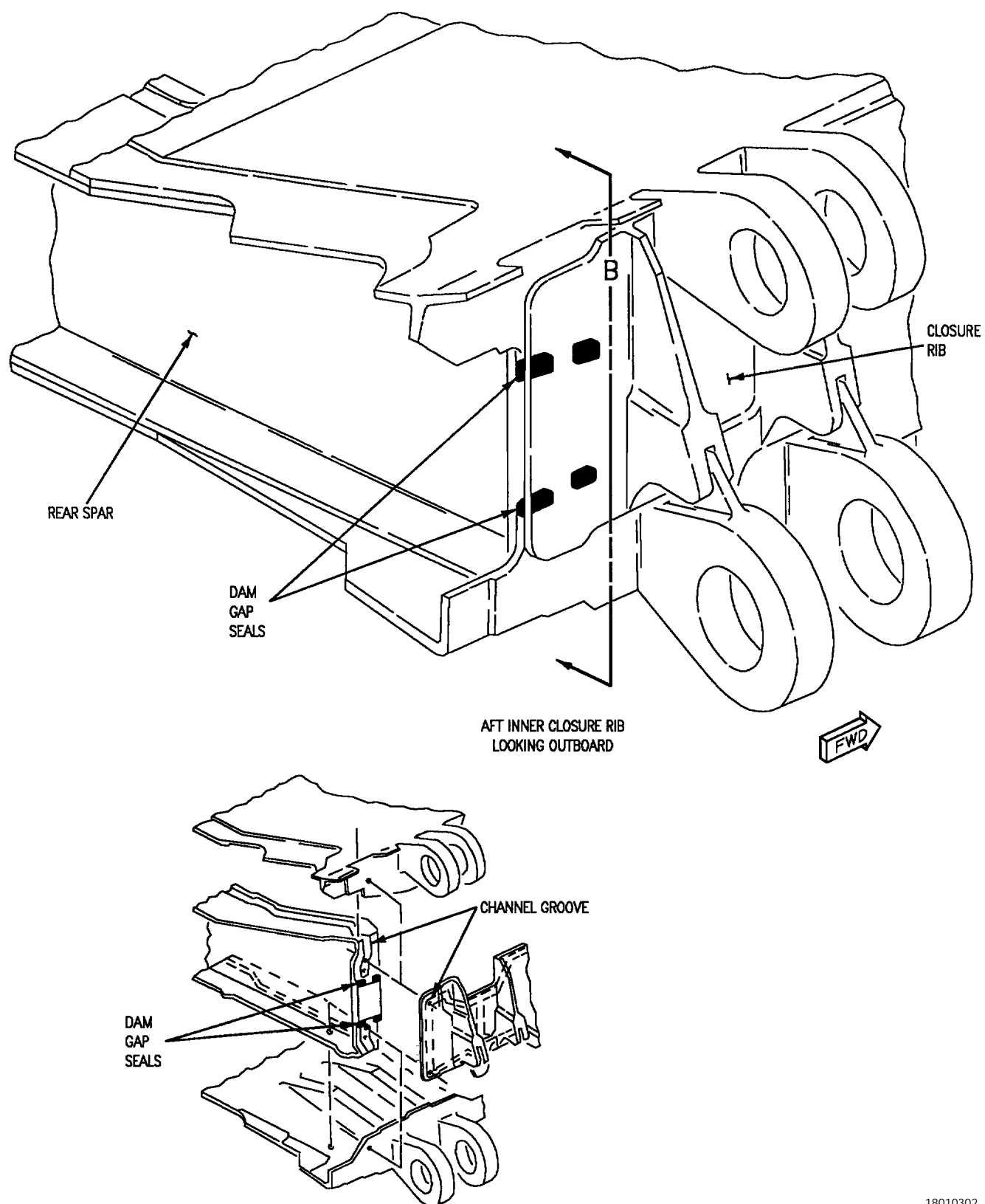
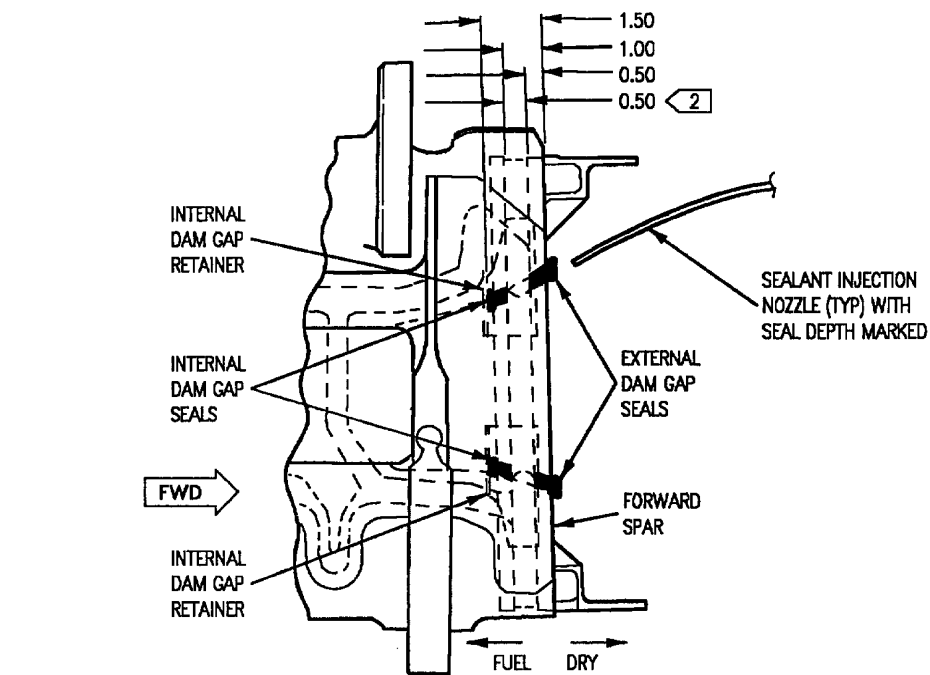
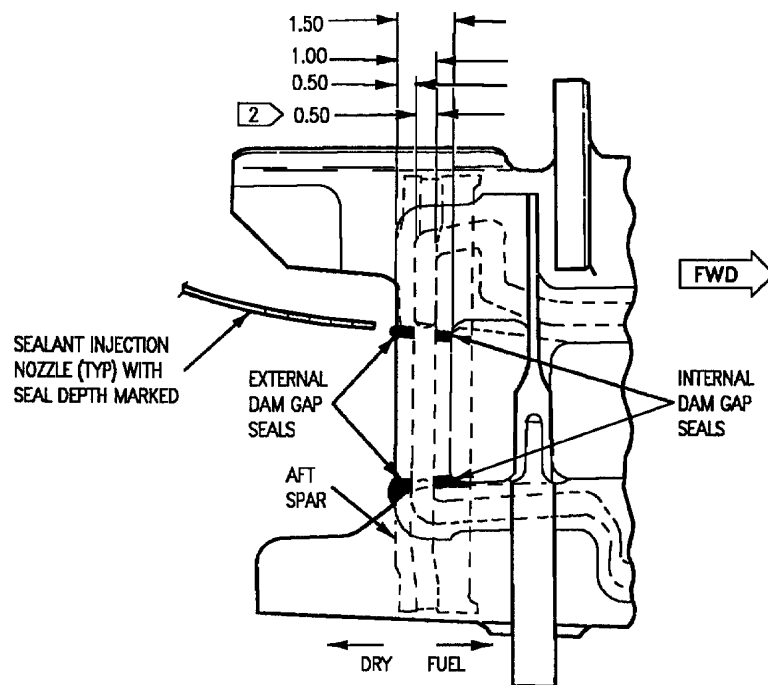


Figure 3. Closure Rib Dam Gap Seal Repair (Sheet 2)



A

LOOKING OUTBOARD



B

LOOKING OUTBOARD

Figure 3. Closure Rib Dam Gap Seal Repair (Sheet 3)

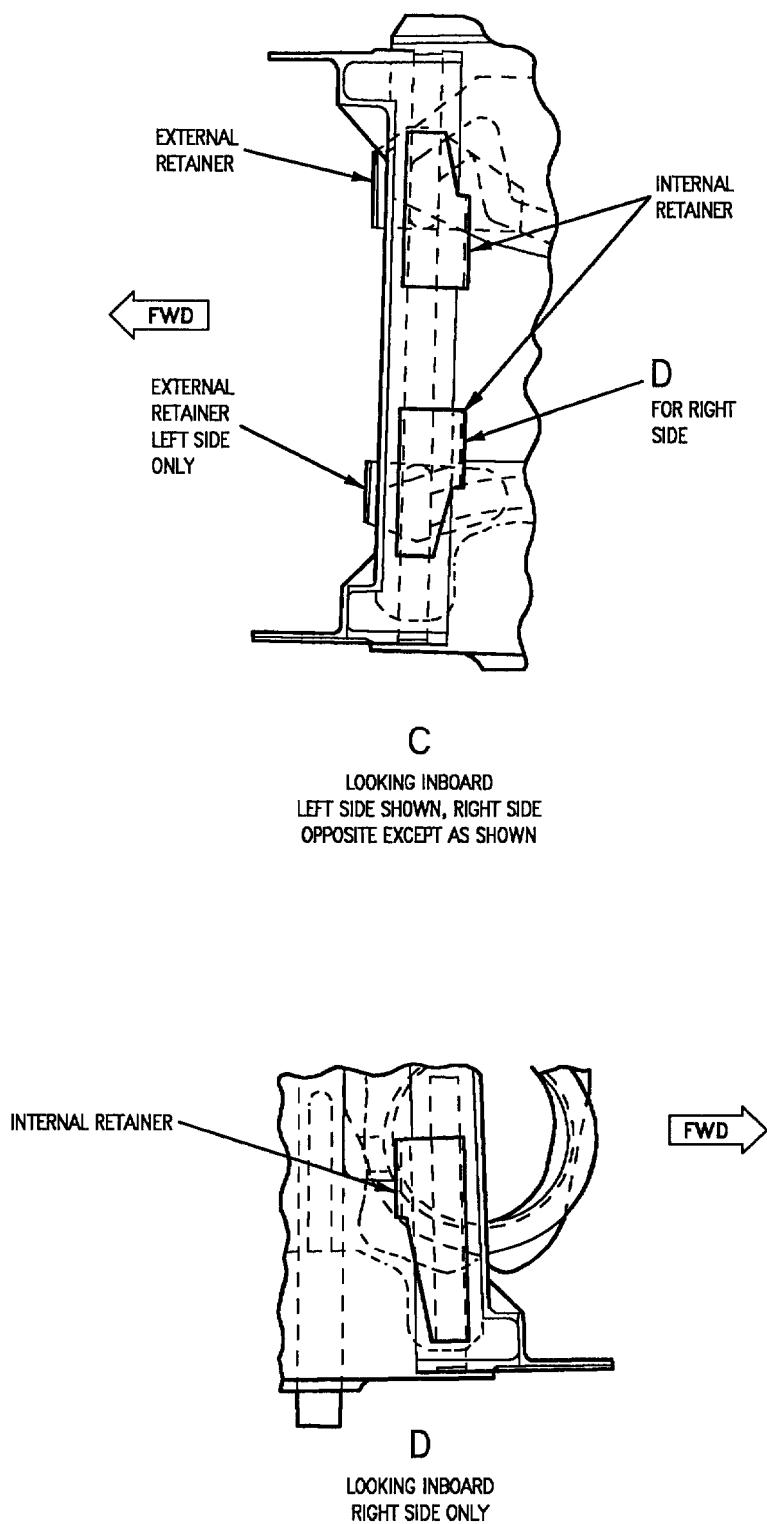


Figure 3. Closure Rib Dam Gap Seal Repair (Sheet 4)

21. KICK RIB DAM GAP SEAL REPAIR. See figure 4.

22. Upper Dam Gap Seals.

a. Remove door 193L (or 193R) and door 34L (or 34R) (A1-F18AC-LMM-010).

NOTE

Access to dam gap seal will be improved by removing flap but is not required for repair.

b. Remove inboard leading edge flap (A1-F18AC-570-300, WP028 00).



Care should be taken, when removing or installing fasteners, not to over-tighten or use excess force, loss of or damage to an inaccessible nut element may occur.

c. Remove dam retainer.

d. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view A.

e. Replace dam gap retainer immediately after re-sealing dam gap.

f. Fillet seal around dam gap retainer for at least 1 inch in all directions from repair. (A1-F18AC-SRM-200, WP011 00).

g. Refuel aircraft and inspect for leaks in repaired dam gap seal. Reinspect after 8 hours or after next flight.

h. Install inboard leading edge flap, if removed, (A1-F18AC-570-300, WP028 00).

i. Install doors 193L (or 193R) and 34L (or 34R) (A1-F18AC-LMM-010).

23. Lower Dam Gap Seals.

a. Remove door 197L (or 197R) and door 113L (or 113R) (A1-F18AC-LMM-010).



Care should be taken, when removing or installing fasteners, not to over-tighten or use excess force, loss of or damage to an inaccessible nut element may occur.

b. Remove dam gap retainer.

c. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view B.

d. Replace dam gap retainer immediately after re-sealing dam gap.

e. Fillet seal around dam gap retainer for at least 1 inch in all directions for repair. (A1-F18AC-SRM-200, WP011 00).

f. Refuel aircraft and inspect for leaks in repaired dam gap seal. Reinspect after 8 hours or after next flight.

g. Install door 197L (or 197R) and 113L (or 113R) (A1-F18AC-LMM-010).

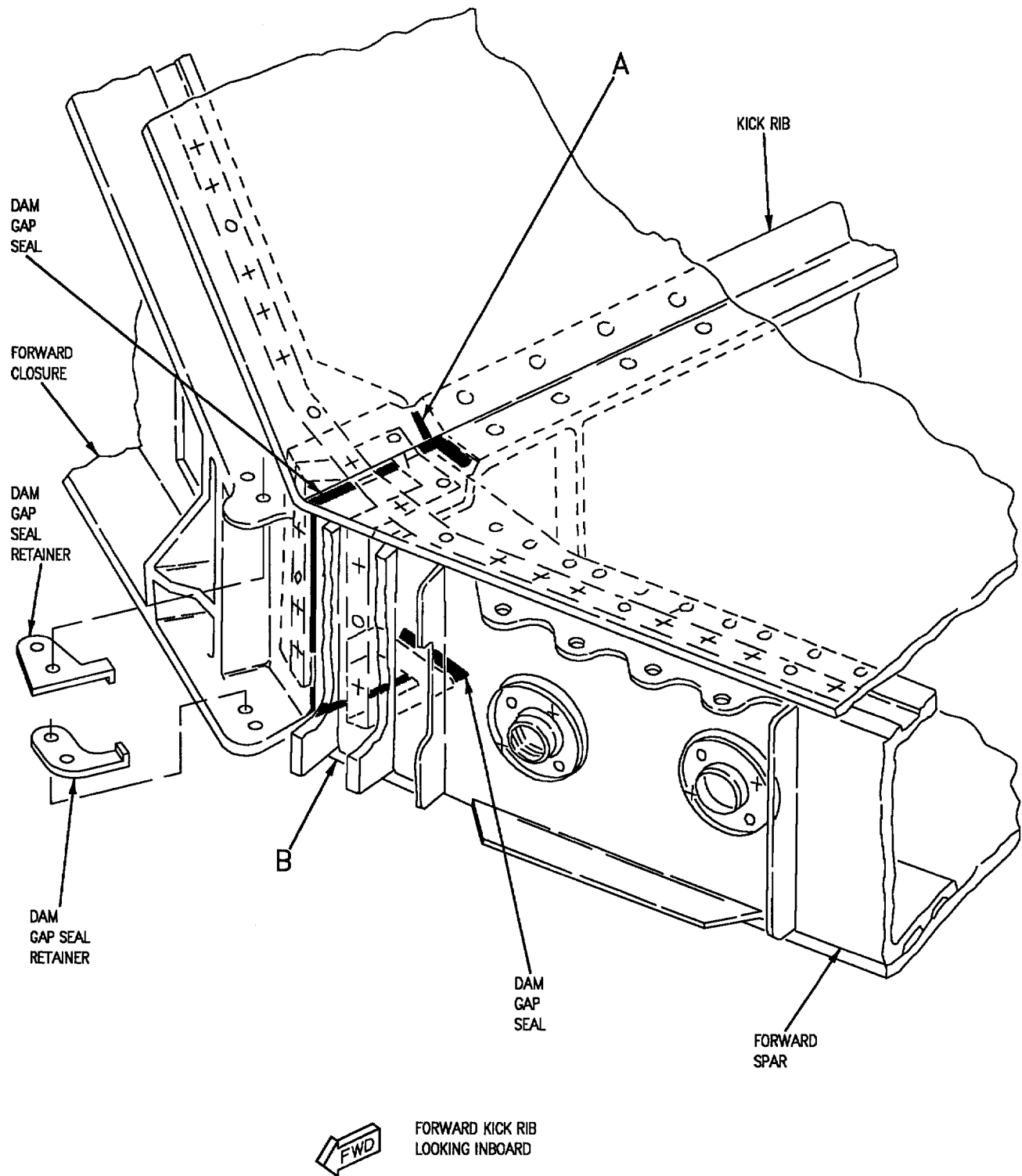


Figure 4. Kick Rib Dam Gap Seal Repair (Sheet 1)

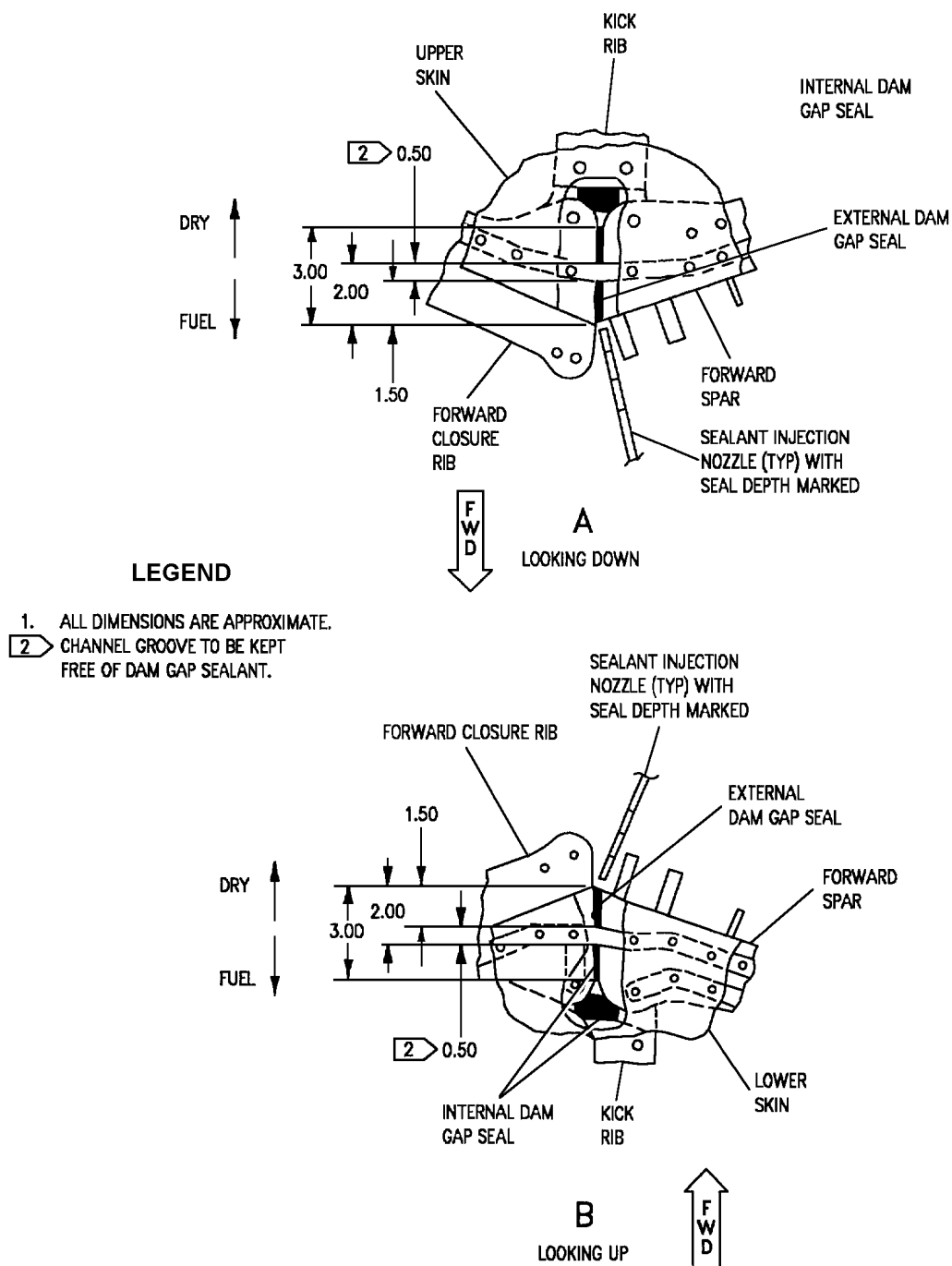


Figure 4. Kick Rib Dam Gap Seal Repair (Sheet 2)

24. WING FOLD RIB DAM GAP SEAL REPAIR. See figure 5.

25. Forward Upper Dam Gap Seal.

a. Remove door 191L (or 191R) (A1-F18AC-LMM-010).

b. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view A.

NOTE

Dam retainer is attached to door 191 and will engage dam when door is installed.

c. Install door 191L (or 191R) (A1-F18AC-LMM-010).

d. Refuel aircraft and inspect for leak in repaired dam gap seal. Reinspect after 8 hours or after next flight.

26. Aft Upper Dam Gap Seal.

a. Remove door 82L (or 82R) (A1-F18AC-LMM-010).

b. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view B.

c. Install door 82L (or 82R) (A1-F18AC-LMM-010).

d. Refuel aircraft and inspect for leak in repaired dam gap seal. Reinspect after 8 hours or after next flight.

27. Aft Lower Dam Gap Seal.

a. Remove door 82L (or 82R) (A1-F18AC-LMM-010).

b. Repair dam gap seal per General Repair Procedure, this WP, from door 82 opening. For seal depth, see view C.

c. Refuel aircraft and inspect for leaks in repaired dam gap seal. Reinspect after 8 hours or after next flight.

d. Install door 82L (or 82R) (A1-F18AC-LMM-010).

28. Forward Lower Dam Gap Seal.

a. Remove door 194L (or 194R) (A1-F18AC-LMM-010).

b. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view D.

NOTE

Dam retainer is attached to door 194 and will engage dam when door is installed.

c. Install door 194L (or 194R) (A1-F18AC-LMM-010).

d. Refuel aircraft and inspect for leaks in repaired dam gap seal. Reinspect after 8 hours or after next flight.

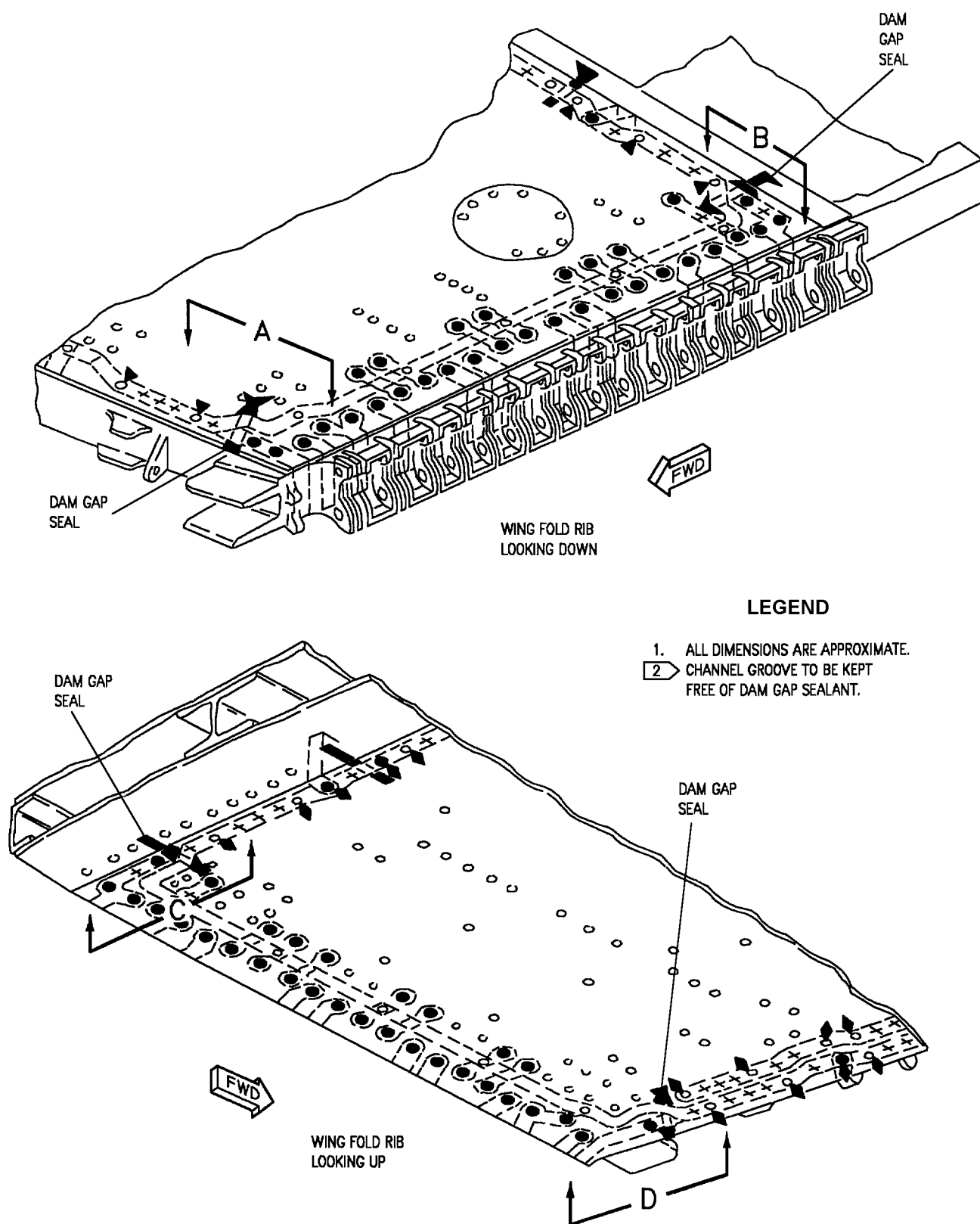
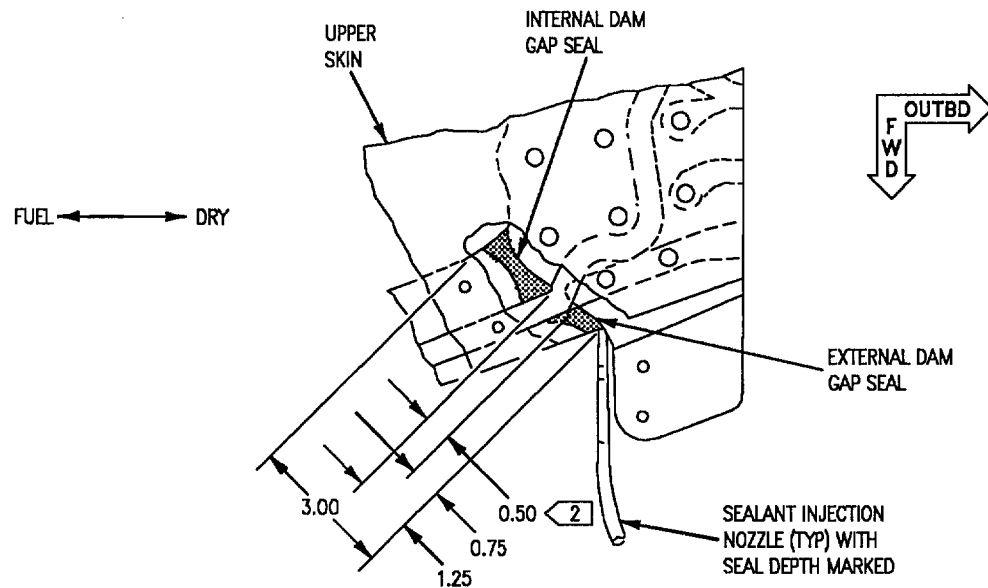
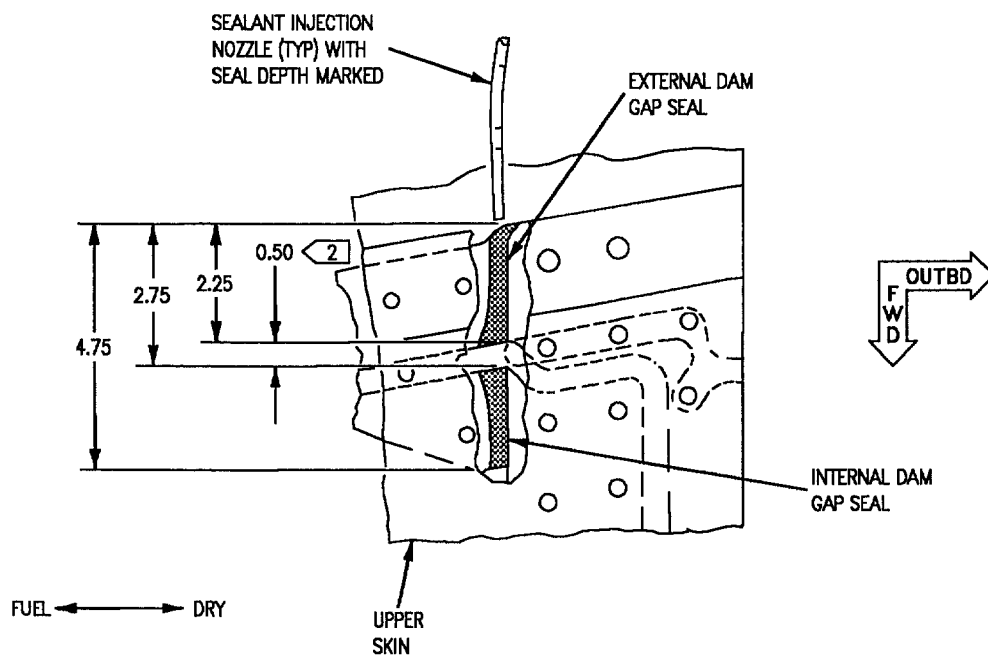


Figure 5. Wing Fold Rib Dam Gap Seal Repair (Sheet 1)



A

FORWARD DAM GAP SEAL
LOOKING DOWN

B

AFT DAM GAP SEAL
LOOKING DOWN

Figure 5. Wing Fold Rib Dam Gap Seal Repair (Sheet 2)

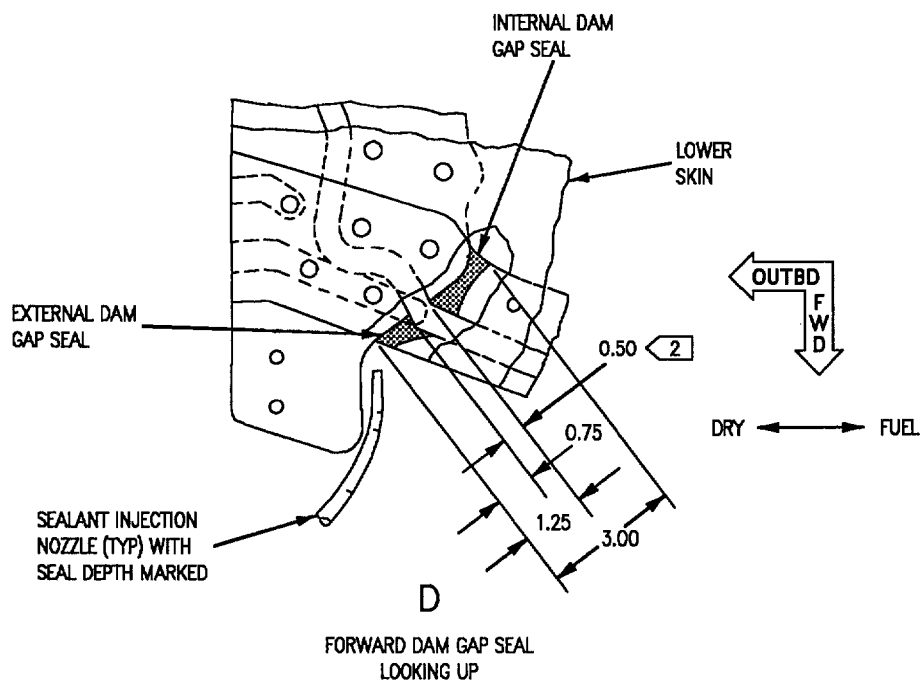
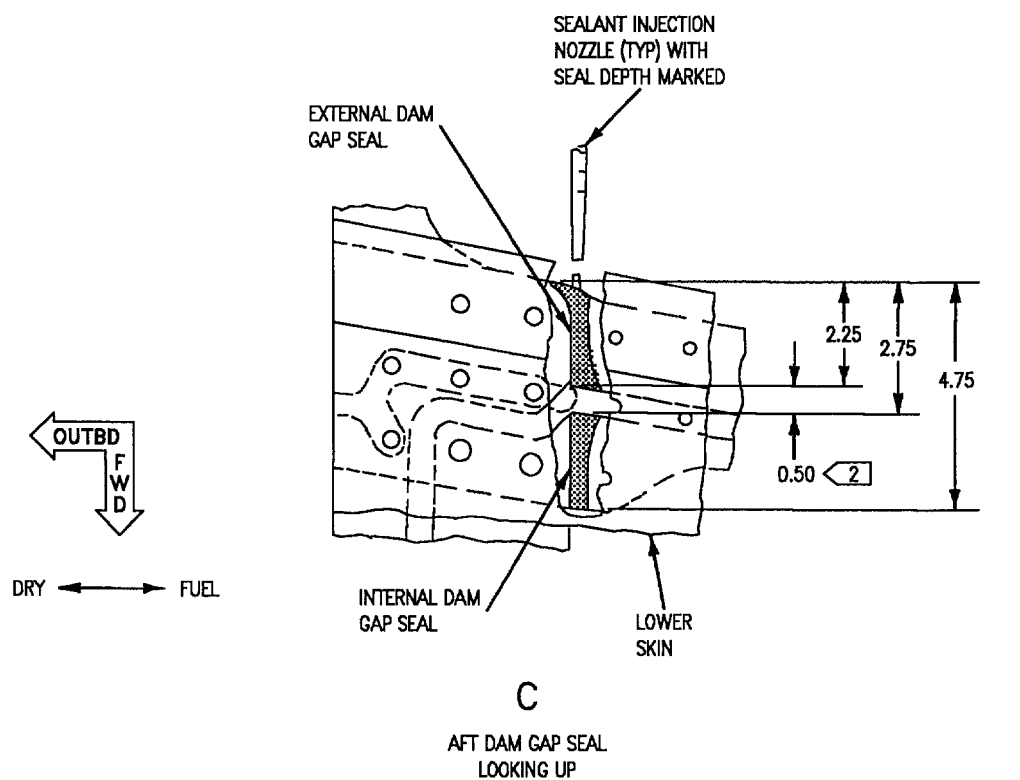


Figure 5. Wing Fold Rib Dam Gap Seal Repair (Sheet 3)

29. OUTBOARD SPLICE PLATES DAM GAP SEAL REPAIR. See figure 6.

30. Upper Outboard Dam Gap Seal.

a. Remove door 79L (or 79R) (A1-F18AC-LMM-010).

b. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view A.

c. Refuel aircraft and inspect for leaks in repaired dam gap seal. Reinspect after 8 hours or after next flight.

d. Install door 79L (or 79R) (A1-F18AC-LMM-010).

31. Upper Inboard Dam Gap Seal.

a. Remove door 79L (or 79R) (A1-F18AC-LMM-010).

b. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view B.

c. Refuel aircraft and inspect for leaks in repaired dam gap seal. Reinspect after 8 hours or after next flight.

32. Lower Inboard Dam Gap Seal.

a. Remove door 79L (or 79R) (A1-F18AC-LMM-010).

b. Repair dam gap seal per General Repair Procedure, this WP, from door 79 opening. For seal depth, see view C.

c. Refuel aircraft and inspect for leak in repaired dam gap seal. Reinspect after 8 hours or after next flight.

d. Install door 79L (or 79R) (A1-F18AC-LMM-010).

33. Lower Outboard Dam Gap Seal.

a. Remove door 79L (or 79R) (A1-F18AC-LMM-010).

b. Repair dam gap seal per General Repair Procedure, this WP, from door 79 opening. For seal depth, see view D.

c. Refuel aircraft and inspect for leak in repaired dam gap seal. Reinspect after 8 hours or after next flight.

d. Install door 79L (or 79R) (A1-F18AC-LMM-010).

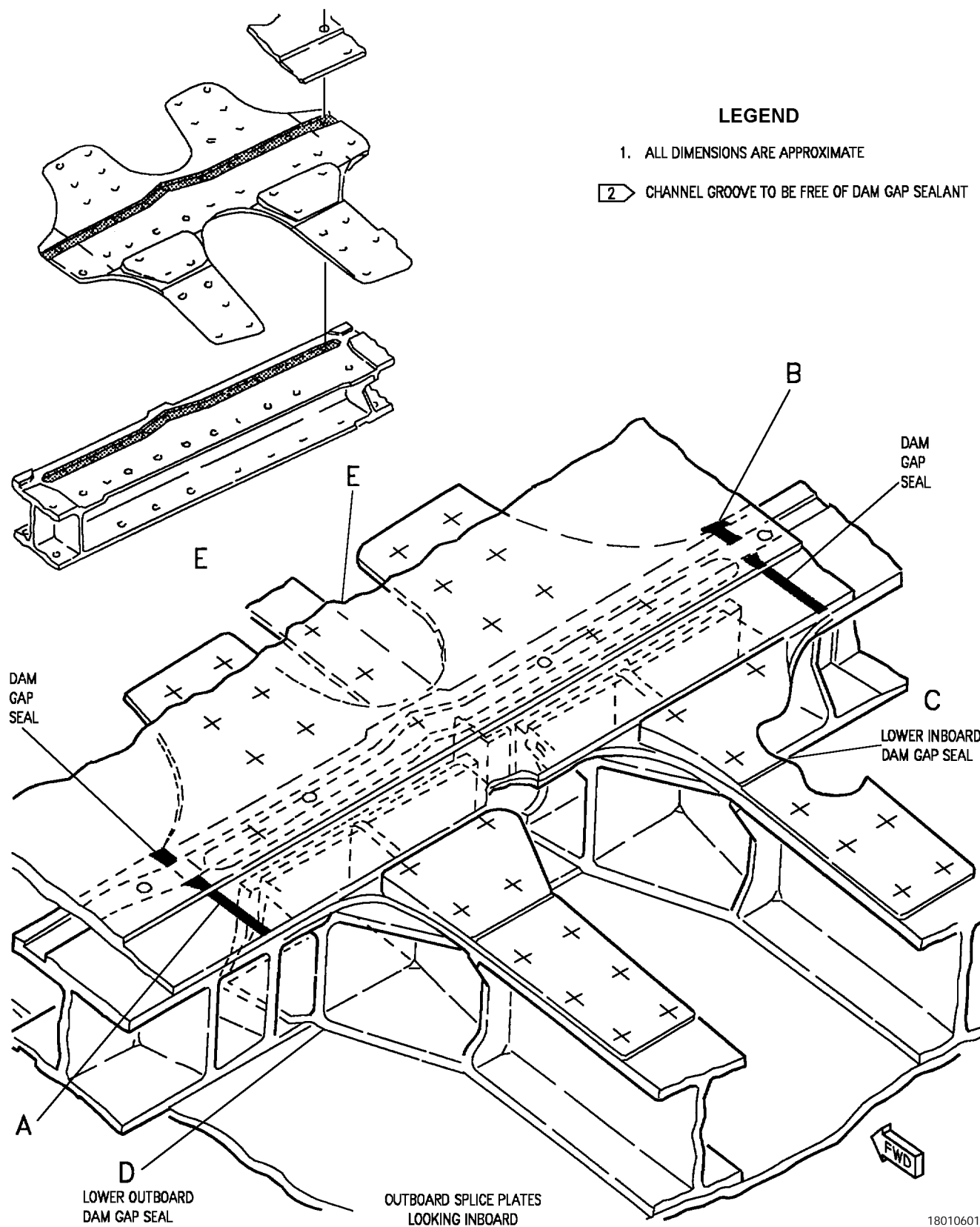


Figure 6. Outboard Splice Plates Dam Gap Seal Repair (Sheet 1)

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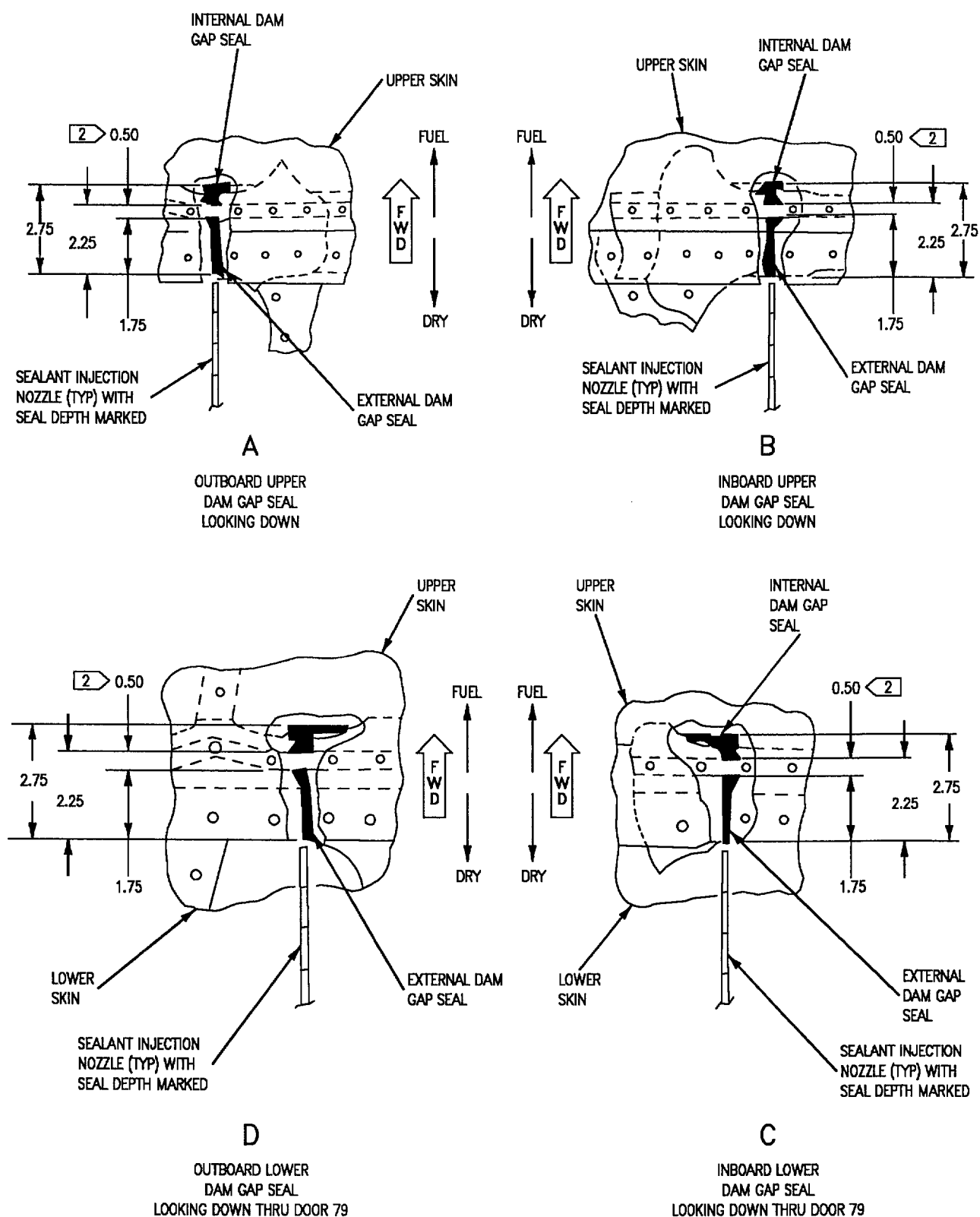


Figure 6. Outboard Splice Plates Dam Gap Seal Repair (Sheet 2)

34. INBOARD SPLICE PLATES DAM GAP SEAL REPAIR. See figure 7.

35. Upper Outboard Dam Gap Seal.

- a. Remove door 79L (or 79R) (A1-F18AC-LMM-010).
- b. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view A.
- c. Refuel aircraft and inspect for leak in repaired dam gap seal. Reinspect after 8 hours or after next flight.
- d. Install door 79L (or 79R) (A1-F18AC-LMM-010).

36. Upper Inboard Dam Gap Seal.

- a. Remove door 79L (or 79R) (A1-F18AC-LMM-010).
- b. Repair dam gap seal per General Repair Procedure, this WP. For seal depth, see view B.
- c. Refuel aircraft and inspect for leak in repaired dam gap seal, Reinspect after 8 hours or after next flight.
- d. Install door 79L (or 79R) (A1-F18AC-LMM-010).

37. Lower Inboard Dam Gap Seal.

- a. Remove door 79L (or 79R) (A1-F18AC-LMM-010).
- b. Repair dam gap seal per General Repair Procedure, this WP, from door 79 opening. For seal depth, see view C.
- c. Refuel aircraft and inspect for leak in repaired dam gap seal. Reinspect after 8 hours or after next flight.
- d. Install door 79L (or 79R) (A1-F18AC-LMM-010).

38. Lower Outboard Dam Gap Seal.

- a. Remove door 79L (or 79R) (A1-F18AC-LMM-010).
- b. Repair dam gap seal per General Repair Procedure, this WP, from door 79 opening. For seal depth, see view D.
- c. Refuel aircraft and inspect for leak in repaired dam gap seal. Reinspect after 8 hours or after next flight.
- d. Install door 79L (or 79R) (A1-F18AC-LMM-010).

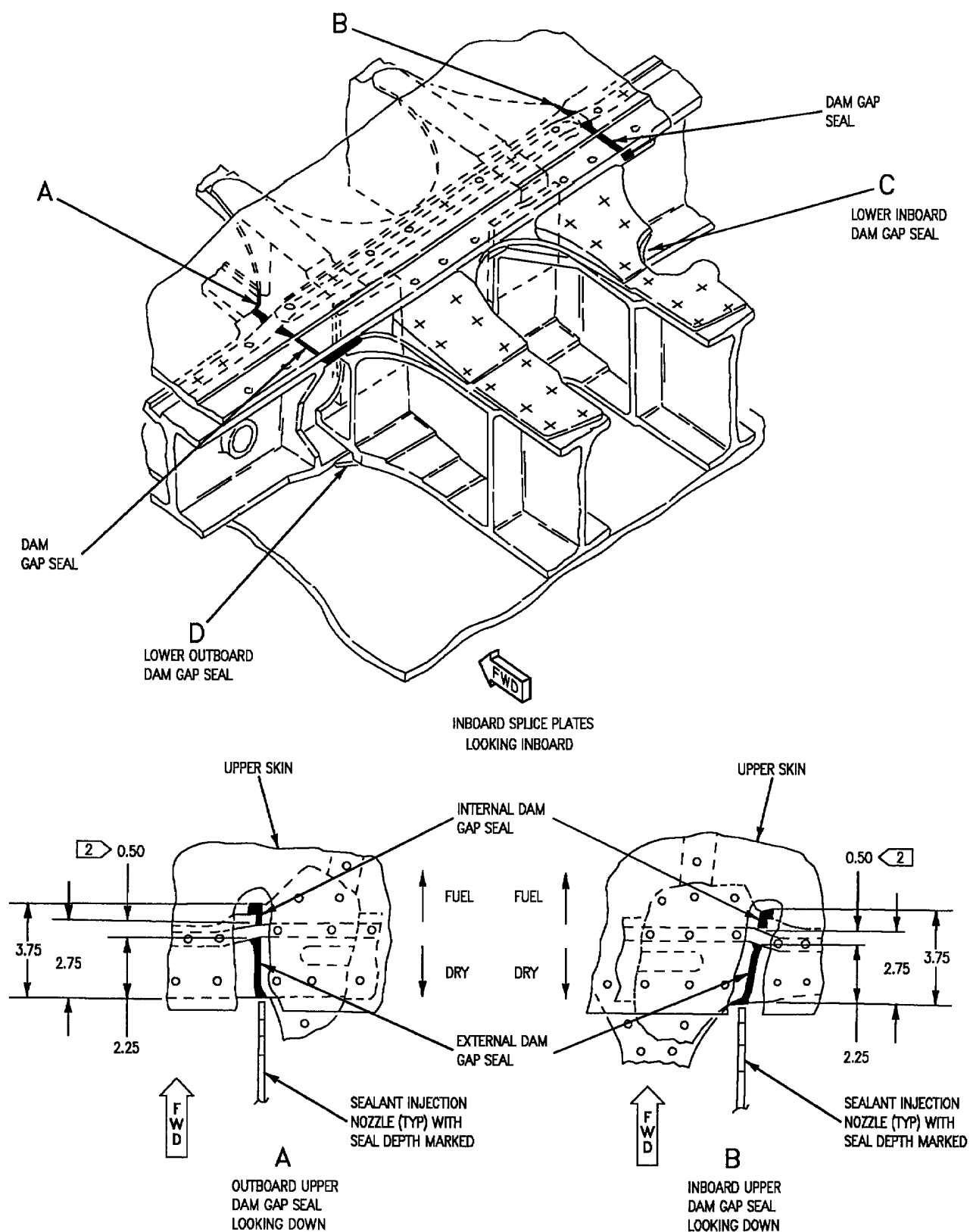


Figure 7. Inboard Splice Plates Dam Gap Seal Repair (Sheet 1)

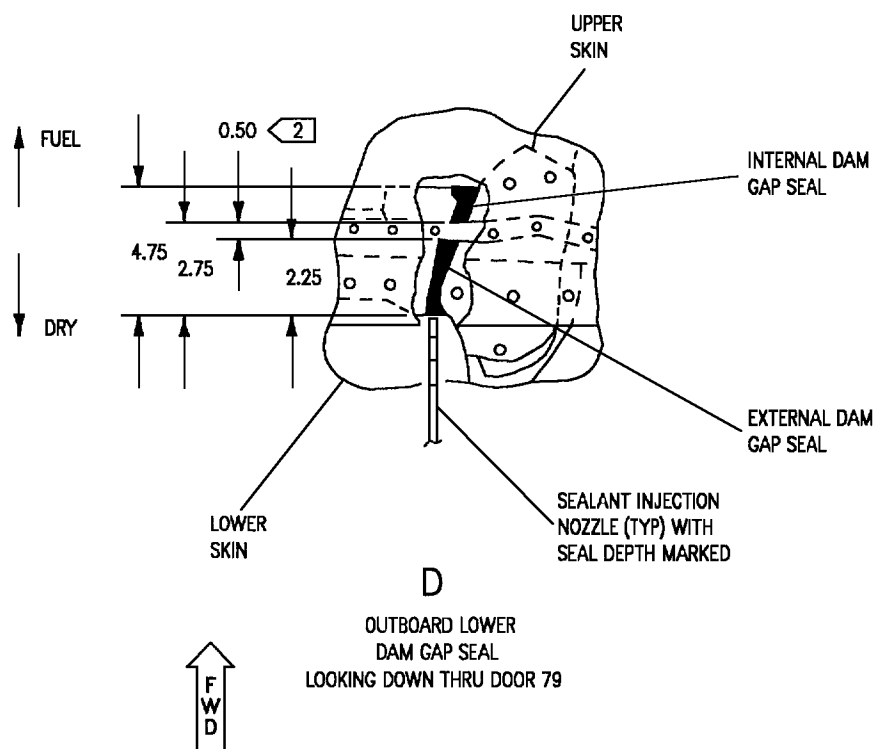
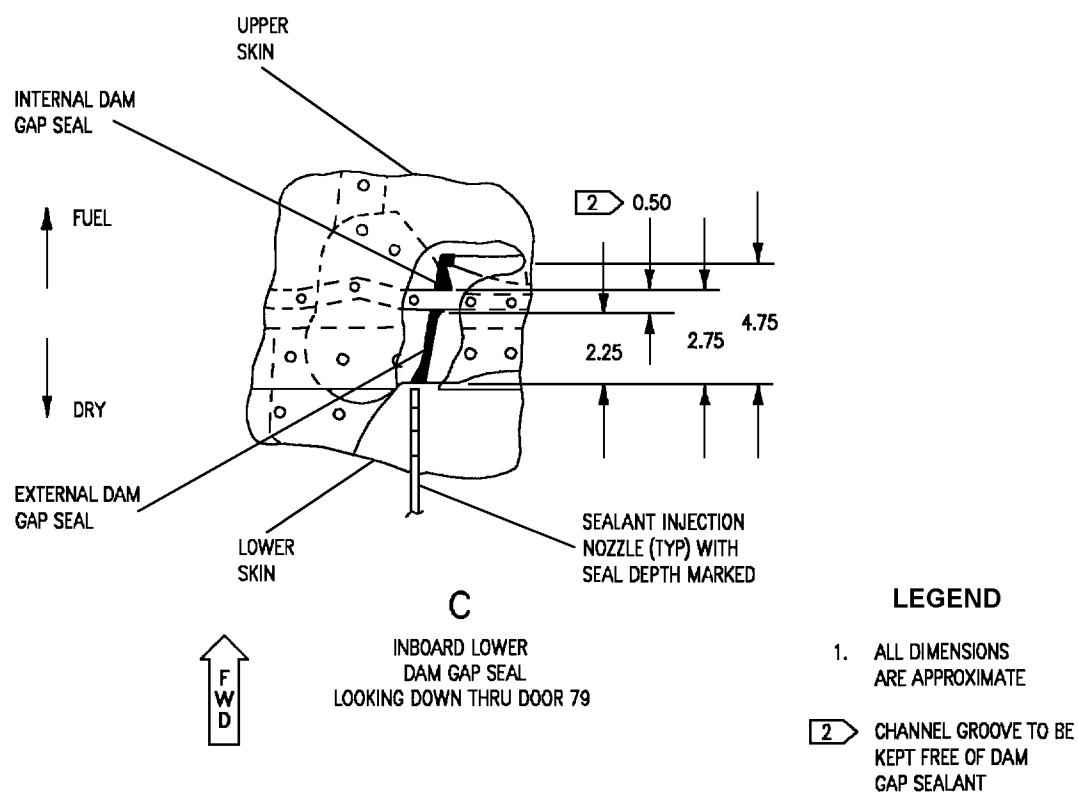


Figure 7. Inboard Splice Plates Dam Gap Seal Repair (Sheet 2)

39. PREPARATION OF SEALING COMPOUND AND INJECTION GUN.

40. The paragraphs below are for preparation of sealing compound and injection gun. For assembly of injection gun, see figure 8.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Air Pressure Regulator, 0 to 150 psi	-
Sealant Gun, Hand	850
Sealant Gun, Pneumatic	220325

Materials Required

NOTE

Alternate item specifications or part numbers are shown in parentheses.

Nomenclature	Specification or Part Number
Cartridge, Sealing Compound	250-CP6
Cartridge, Sealing Compound	Sem Kit 250-CP6
Nozzle, Injection	TBM-1-8-12
Nozzle, Sealant Gun	420
Sem-Luer Adapter	231871
Sealing Compound	MIL-S-83430 (MIL-S-8802)

41. SEALING COMPOUND PREPARATION, MIL-S-83430, MIL-S-8802 OR PR1826.

MIL-S-83430 and MIL-S-8802 are sealing compounds requiring several hours of cure time. PR1826 is a much faster curing sealing compound for when long cure time is not possible or desired. When using PR1826, complete the preparation, application and curing procedures per the A1-F18AC-SRM-200, WP011 00.

42. **Mixing Instructions.** For preparation of sealing compound (A1-F18AC-SRM-200, WP011 00).

43. **PREPARATION OF SEALANT GUNS.** See figure 8.

44. Pneumatic Sealant Gun.

a. Install handpacked sealing compound cartridges or prepacked Sem kit sealing compound cartridges in pneumatic sealant gun.

b. Install adapter and correct injection nozzle.

c. Connect hose assembly to pressure regulator.

d. Connect pressure regulator to compressed air source.

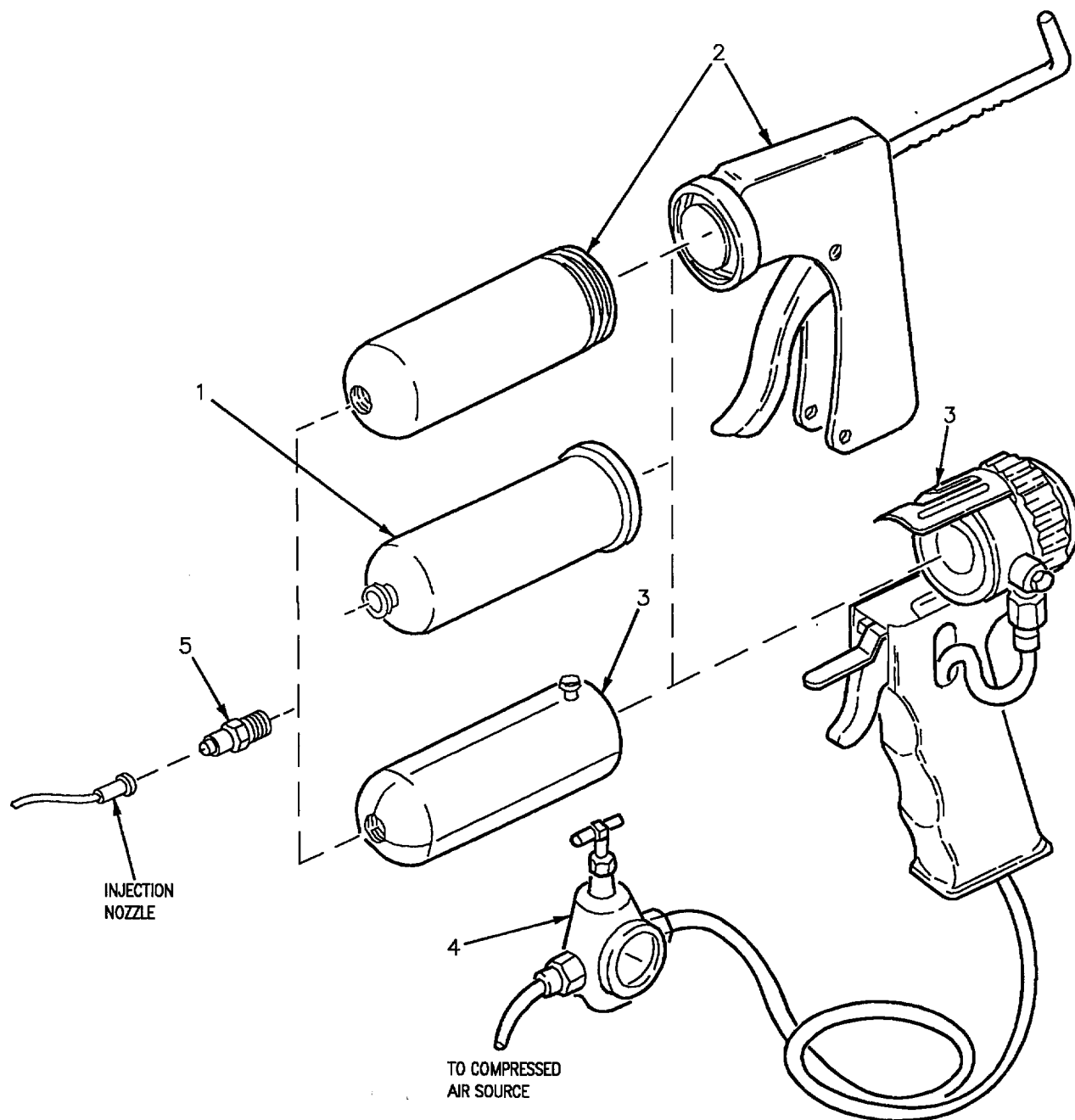
e. Adjust pressure regulator from 0 to 100 psi operating range.

f. Trigger pneumatic sealant gun until there is a smooth flow of sealing compound.

45. Hand Sealant Gun.

a. Install handpacked sealing compound cartridge or prepacked sem kit sealing compound cartridge in hand sealant gun.

b. Install adapter and correct injection nozzle.



INDEX	NOMENCLATURE	PART NUMBER
1	SEMKIT OR CARTRIDGE	250-CP6
2	HAND SEALANT GUN	850
3	PNEUMATIC SEALANT GUN	250
4	PRESSURE REGULATOR	----
5	SEM-LUER ADAPTER	231871

Figure 8. Sealant Gun Preparation

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

WING FUEL TANK CHANNEL GROOVE SEAL INJECTION

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Upper Inner Wing Skin Fasteners	WP003 01
Lower Inner Wing Skin Fasteners	WP003 02
Inner Wing Structure	WP004 00
Wing Fuel Tank Fillet and Packing Sealing Procedures	WP018 00
Wing Fuel Tank Dam Gap Seals Repair	WP018 01
Wing Fuel Tank Leak Detection and Isolation	WP026 00
Electrical System	A1-F18AC-420-300
Utility Battery and Charger Unit or Utility Battery	WP019 00
Emergency Battery and Charger Unit or Emergency Battery	WP020 00
Integrated Flight Controls	A1-F18AC-570-300
Leading Edge Flap Ball Bearing Unit and Left and Right Torque Tubes and Angle Drive Unit	WP037 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Plane Captain Manual	A1-F18AC-PCM-000

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Record of Applicable Technical Directives

None

1. DESCRIPTION.

2. This work package contains instructions for wing fuel tank channel groove seal injection. When a fuel leak requires repair, the determination shall be made whether to defuel the aircraft to safely do a repair. Observe all safety precautions as described below.

3. SAFETY PRECAUTIONS.

a. Make sure external electrical and hydraulic power are removed from aircraft, disconnect and tie back leads to utility and emergency batteries (A1-F18AC-420-300, WP019 00 and WP020 00), and a NO POWER placard is over power receptacle.

b. Make sure aircraft is grounded to approved static grounding point before starting any fuel tank maintenance (A1-F18AC-PCM-000).

c. Make sure radar is not operating in the vicinity of fuel tank maintenance.

d. Make sure enough fire fighting equipment is available.

e. Do not allow smoking within 100 feet of fuel tank maintenance operation.

f. Do not allow operation of aircraft engines and/or spark/heat producing equipment within 50 feet of fuel tank maintenance operation.

g. Do not allow any liquid oxygen operations within 100 feet of fuel tank maintenance operation.

h. Only explosion-proof droplights and flashlights are to be used during fuel tank maintenance operation.

4. DEFINITIONS.

Across Dam - Injecting channel groove sealing compound from one side of a dam gap seal to the other.

Blind Injection - Final injection of channel groove seal without an observation hole.

Channel Groove Sealing Compound - Sealing compound that contains no catalyst or curing agent and is a non-hardening putty-like material unaffected by shock, vibration, or thermal cycling.

First Level Channel Groove - Between skin and structure.

Injection Fastener - Permanent fastener with removable setscrew for injection nozzle.

Injection Hole - Injection point, for either removable or permanent fastener.

Observation Hole - Outlet for sealing compound when injecting a channel groove seal.

Removable Fastener - Removable at injection point.

Second Level Channel Groove - Between structure and substructure. Not always with first level channel groove.

Straight Run - Injecting several consecutive injection fasteners one after the other in direction of sealing compound flow.

Wrap Around - Channel groove that goes from one surface to another.

5. GENERAL RESEALING PROCEDURES.

NOTE

For information on replacement injection point fasteners, refer to (WP003 01) for upper skin, (WP003 02) for lower skin, and (WP004 00) for inner closure rib.

6. The paragraphs below are typical for resealing of wing fuel tank channel groove seals. Refer to Specific

Resealing Procedures, this WP, for area to be resealed, before continuing with steps below.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Adapter Set	74D460008
Allen Wrench, 1/16 inch	TD481T3
Cartridge Adapter Kit	Semco 226358
Pneumatic Sealant Injection Gun	Grover Smith 223
Regulator, 0 to 150 psi	538A
Sealant Gun Regulating Valve	74D460017
Torque Wrench, 0 to 200 Inch-Pounds	-

Materials Required

NOTE

Alternate item specifications or part numbers are shown in parentheses.

Nomenclature	Specification or Part Number
Cartridge, Sealing Compound	Sem Kit 250-CP6
Gloves, Chemical	ZZ-G-381, Type 1, Style 1
Isopropyl Alcohol	TT-I-735, Grade 1
Respirator with Cartridge	GGG-M-125/6
Rymple Cloth	AMS-3819
Sealing Compound	G-651A (Q4-2805)

7. LEAK INSPECTION. See figure 4 for channel groove seal injection procedures index.

a. Before doing injection procedure, do steps below:

(1) Isolate, classify, and determine the source of fuel leak (WP026 00).

(2) When fuel leak area has been identified, before injection of channel groove sealing compound, check for correct fastener torque

and damaged packings (if required) on all sides of fuel leak (WP018 00).

8. ADAPTER SET, TANK SEALING 74D460008. See figures 1 and 2.

a. The hose assembly (1, figure 1) is used where access is difficult to connect the pneumatic sealant injection gun (injection gun) to the different fittings (3), (5), or (10). A coupler with female pipe threads connects the hose assembly (1) to the injection gun. When the injection gun has the cylinder plunger (4, figure 2) attached, the adapter (13) is needed to attach the hose assembly (1, figure 1). A pin type connector on the other end of the hose assembly (1) attaches to the fittings (3), (5), or (10).



Every hole should be measured with the spacer selection gage (8). Incorrect spacers could cause loss of or damage to inaccessible plate nuts or gang channels.

b. The spacer selection gage (8) is used to select the correct length spacers (2) for use with adapters (7) for removable fasteners.

c. The observation bolt (6) is used in the observation holes to prevent sealing compound injection into wing tank area.

d. The spacers (2) are used with the adapters (7) to prevent the adapters (7) from bottoming out in the removable fastener plate nuts or gang channel nuts and to align the adapter slot with channel groove. Different lengths of spacers (2) are required because of the varying thicknesses of the wing skins and structure and to inject first or second level channel grooves.

NOTE

The adapter set may contain adapters (4), (7), and (12) with or without threads. With threads, adapter tightens into attaching hardware at fastener hole. Without threads, adapter is held in place in fastener hole by hand while injecting.

e. The adapters (7) are installed in the removable fastener holes and used for injecting sealing compound.

f. The adapters (4) or (12) are used for injecting sealing compound in nonremovable injection fasteners. The adapter (12) used with washer (11) is the primary adapter for nonremovable fasteners.

g. The unthreaded adapter (9) is used for injecting sealing compound in the sealing injection plugs.

h. The fittings (3), (5), or (10) are 90°, 45°, and straight alemite fittings used as required to connect hose assembly (1) to the adapters (4), (7), (9), or (12).

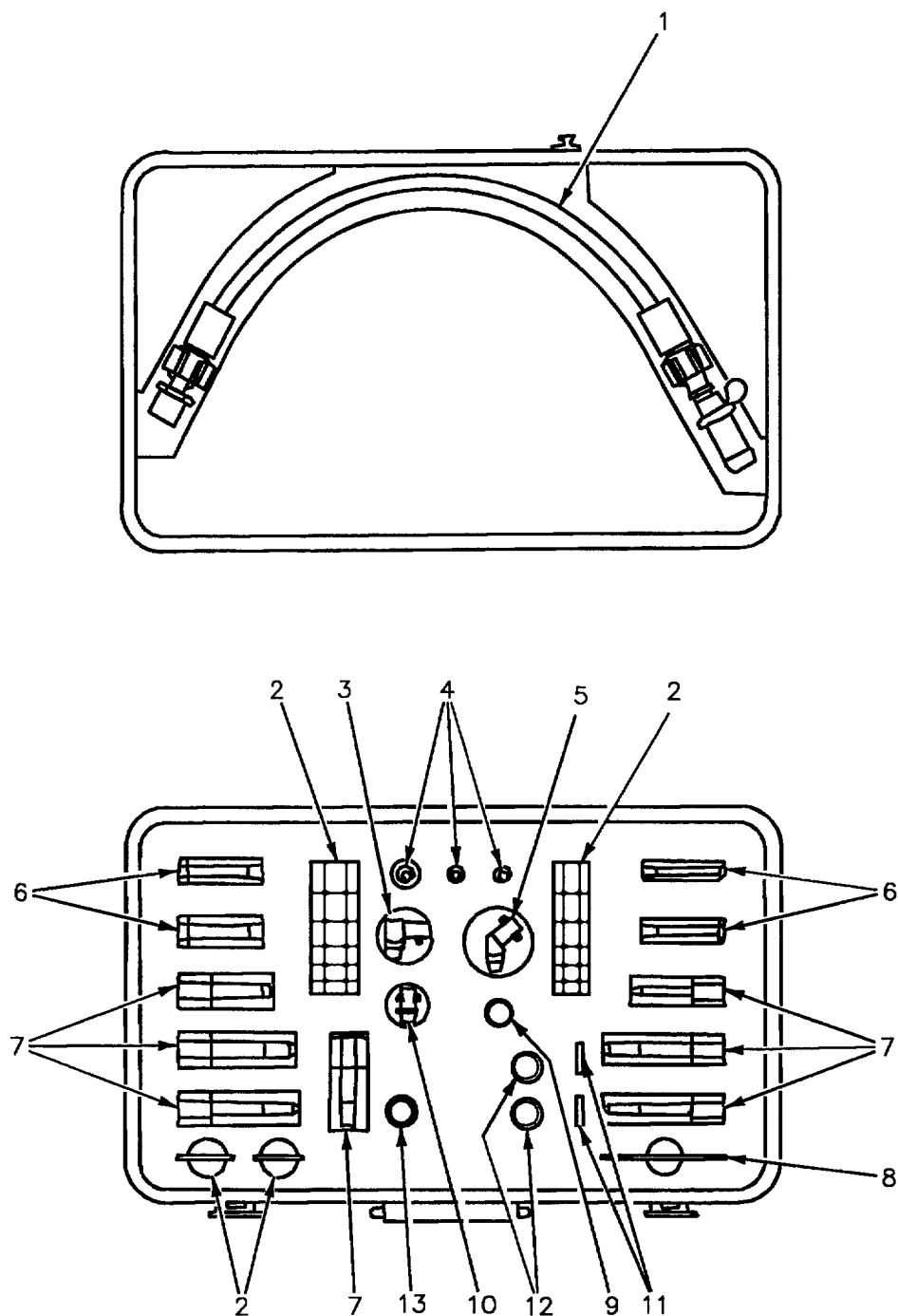


Figure 1. Adapter Set, Tank Sealing (Sheet 1)





INDEX NO	NOMENCLATURE	PART NUMBER
1	HOSE ASSEMBLY	74D461010-1001
2	SPACER	74D461003-2001,-2003, -2005,-2007,-2009,-2011, -2013,-2015,-2017,-2019, -2021,-2023,-2025,-2027, -2029,-2031
3	90° FITTING	ST7M298-2 (A358) 
4	ADAPTER, HOLLOW SCREW	74D461006-2001
5	45° FITTING	ST7M298-3 (A684) 
6	BOLT, EXTERNALLY RELIEVED BODY, OBSERVATION	74D461007-2001,-2003, -2005,-2007
7	ADAPTER	74D461002-2013,-2015, -2017,-2019,-2021,-2023, -2027
8	GAGE, SPACER SELECTION	74D461008-2001
9	ADAPTER, OFFSET CHANNEL, UNTHREADED	74D461016-2003
10	STRAIGHT FITTING	ST7M289-1 (M336) 
11	WASHER	74D461054-2003
12	ADAPTER, HOLLOW SCREW	74D461054-2001
13	ADAPTER, OFFSET CHANNEL, UNTHREADED	74D461016-2005
 ALEMITE DIVISION OF STEWART WARNER CORP. (95879)		

Figure 1. Adapter Set, Tank Sealing (Sheet 2)

9. PREPARATION OF PNEUMATIC SEALANT INJECTION GUN. See figure 2.

NOTE

Be sure regulator (10), 74D460017, is installed on sealant gun for both bulk sealing compound or cartridge sealant applications.

10. The steps below are used to change the pneumatic sealant injection gun (injection gun) from use of bulk sealing compound to the use of sealant cartridges. If bulk sealing compound is used, go to step j.

a. Disconnect air coupler (8) from coupler adapter (7).

b. Remove loader cylinder (6) from cylinder adapter (3).

c. Assemble cap (16) with street ell (17) and hanson male connector (18).

d. Assemble cap (16) with barrel (15) handtight.

e. Insert cartridge (19) loaded with G-651A sealing compound into barrel (15) flanged end up.

f. Attach barrel (15) and cartridge (19) to cylinder (3) using adapter (20) and gasket (21) handtight.

g. Attach air coupler (8) to hanson male connector (18).

NOTE

The injection nozzle (2) or (5) is not used in the procedure to reseal the integral wing tank channel groove.

h. Remove the injection nozzle (2) or (5) from the plunger cylinder (1) or (4).

NOTE

When installing the hose assembly (14) on plunger cylinder (4) use of the adapter (13) is required.

i. Remove caps from hose assembly (14) and install hose assembly (14) on plunger cylinder (1) or (4).



Regulated air pressure will be used when injecting sealing compound into channel grooves. The injection gun has a 70 to 1 pressure ratio. Use of unregulated air pressure will result in damage to the aircraft wing.

j. Connect air coupler (9) to compressed air.

(1) If maintenance shop compressed air is used.

(a) Connect hose assembly (23) to air coupler (9) and pressure regulator (22).



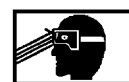
Before connecting maintenance shop air to regulator, set regulator to 0 psi or fully closed. Connecting maintenance shop air with regulator open could cause regulator gage to break.

(b) Connect pressure regulator (22) to maintenance shop compressed air.

(2) If an air compressor is used, connect air compressor supply hose to air coupler (9).

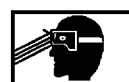
k. Adjust pressure regulator (22) or air compressor pressure regulator to provide 100 to 125 psi.

l. Adjust gun pressure regulator (10) to provide 55 to 57 psi.



Sealing Compound

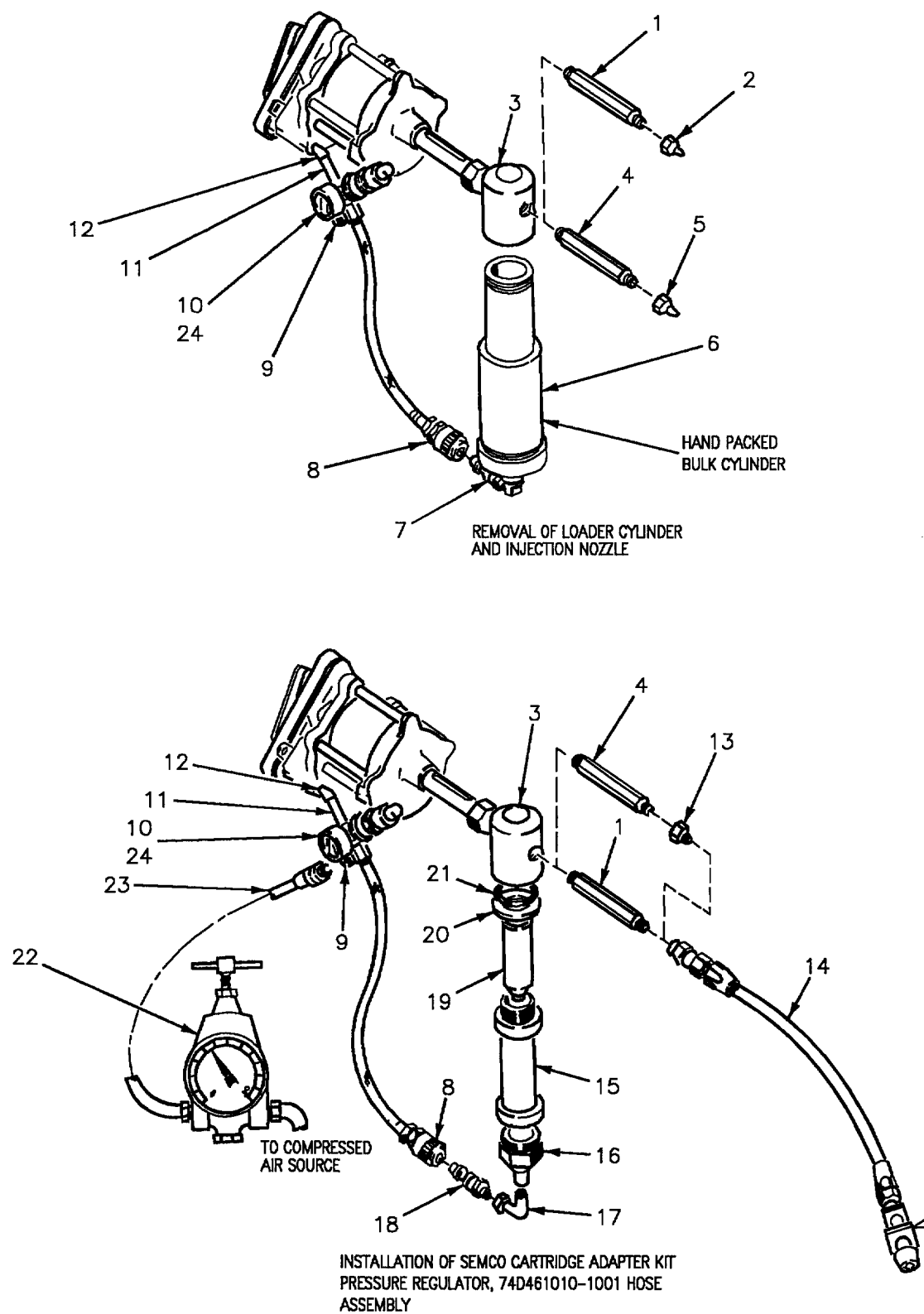
11



Sealing Compound

12

m. Trigger gun until there is a smooth flow of sealing compound, free of trapped air.



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Figure 2. Pneumatic Sealant Injection Gun, Preparation (Sheet 1)

INDEX	NOMENCLATURE	PART NUMBER
1	CYLINDER PLUNGER ALTERNATE	1 28V
2	NOZZLE, INJECTION	1 52V
3	CYLINDER ADAPTER	1 253N
4	CYLINDER PLUNGER	1 28HN
5	NOZZLE, INJECTION	1 52
6	LOADER CYLINDER	1 252N
7	COUPLER ADAPTER	1 60B
8	AIR COUPLER	1 918
9	AIR COUPLER	1 918
10	4 REGULATOR 4 REGULATOR GAGE	5 7M647-1 5 7M842-1 5 7M843-1
11	NIPPLE	5 74D460017-2001
12	ELBOW	5 AN915-1J
13	ADAPTER	2 74D461016-2005
14	HOSE ASSEMBLY	2 74D461010-1001
15	BARREL	3 13115
16	CAP	3 13116
17	STREET ELL, 1/8-INCH NPT	3
18	HANSON MALE CONNECTOR 1/8-INCH NPT	3
19	CARTRIDGE	94-013GS
20	ADAPTER	3 13114
21	GASKET	3 13113
22	PRESSURE REGULATOR, 0 TO 150 PSI	
23	HOSE ASSEMBLY	
24	6 PLUG	5 MS20913-1J

1 COMPONENT OF PNEUMATIC SEALANT INJECTION GUN P/N 223.
 2 COMPONENT OF TANK SEALING ADAPTER SET P/N 74D460008.
 3 COMPONENT OF CARTRIDGE ADAPTER KIT, P/N 226358.
 4 REGULATED TO 55-57 PSI.
 5 COMPONENT OF SEALANT GUN REGULATING VALVE PIN P/N 74D460017.
 6 INSTALL IN OPEN PORT OF REGULATOR.

Figure 2. Pneumatic Sealant Injection Gun, Preparation (Sheet 2)

11. SELECTION AND INSTALLATION OF SEALANT INJECTION ADAPTERS AND OBSERVATION BOLT. See figure 3.

12. Three types of injection fittings are used in sealant injection holes. For the correct application, see below:



Use of wrong thickness spacers with injection adapters, failure to use observation bolts in observation holes, and incorrect torque of injection adapter will cause incorrect sealing and leakage of sealing compound into fuel tank area.

NOTE

Reinstall removed bolts, setscrews, and injection plug screws into same hole they were removed from.

Adapters (4), (6), and (15) may be threaded or unthreaded. With threads, adapter tightens into attaching hardware at fastener hole. Without threads, adapter is held in place in fastener hole by hand while injecting.

13. **Removable Bolt.** Adapter (15) is used to inject sealing compound at removable bolt.

WARNING

Fuel leakage may occur when removing removable bolt for sealing compound injection.

a. Defuel aircraft (A1-F18AC-PCM-000).

b. Remove bolt and select correct diameter adapter (15).

c. Select correct spacers (13) and/or (14) by spacer selection page (11).



Failure to install correct spacers (13) and/or (14) with adapter (15) could cause loss of or damage to an inaccessible nut.

d. Install required spacers (13) and/or (14) with adapter (15) into hole to be sealed.

e. Align the slot indicator on the flat of the adapter (15) with the channel groove as parallel to the channel groove as possible.

f. Install fitting (1), (2), or (3) handtight, plus 1/4 turn using two wrenches.

g. Complete sealing compound injection per Sealing Compound Injection, this WP. Reinstall, seal, and torque fastener (WP018 00).

14. **Hi-Lok Fasteners (Nonremovable).** Two types of adapters (4) or (6) are used to inject sealing compound into nonremovable fasteners.

a. Adapter (4) is used in limited access areas. When using adapter (4), washer (5) must be used.

b. Adapter (6) is used in unlimited access areas.

c. Install adapter (4) or (6) on fitting (1), (2), or (3) handtight.

NOTE

Inspect fastener head to make sure that only one setscrew (8) is installed.

d. Remove setscrew (8) from head of fastener using 1/16-inch allen wrench (7).



If adapters (4) and (6) are threaded, over tightening, or side loading, when installing adapters (4) or (6), could cause breaking of stud.

e. Install adapter (4) or (6) into hole of fastener.



When required to use the hose assembly (1, figure 1), extreme care must be taken not to break the stud on the adapter (4 or 6, figure 3).

f. Install hose assembly (1, figure 1) to fittings (1, 2, or 3, figure 3).

g. Complete sealing compound sealant injection per Sealing Compound Injection, this WP. Reinstall set-screw (8) flush with head of fastener.

15. Injection Plug Adapter. Adapter (9) is used to inject sealing compound at sealant injection plugs.

a. Remove screw (10) from sealant injection plug hole.

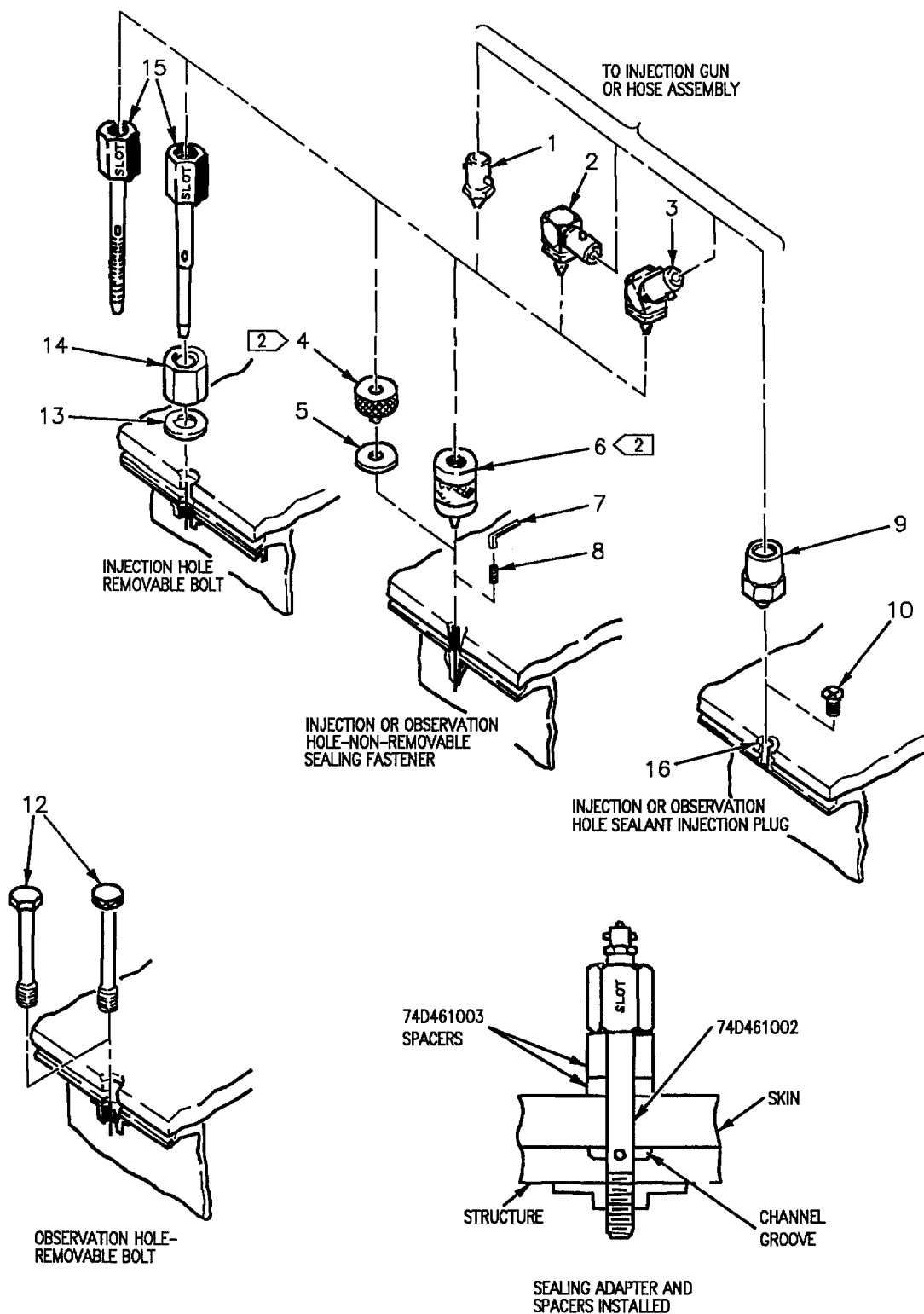
b. Insert nonthreaded adapter (9) into sealant injection plug hole. Hold nonthreaded adapter (9) firmly against sealant injection plug while operating injection gun.

c. Complete sealing compound injection per Sealing Compound Injection, this WP. Reinstall screw (10) into injection plug hole.

16. Observation Hole. Observation bolt (12) is installed, hand tight, into removable fastener hole when used as observation hole and will prevent sealing compound from entering into fuel tank area.

a. Remove injection fastener next to installed adapter, in direction of sealing compound flow, to be used as observation hole.

b. Install observation bolt (12), hand tight, if observation hole has removable fastener.



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Figure 3. Sealant Injection Fitting and Adapter Installation (Sheet 1)

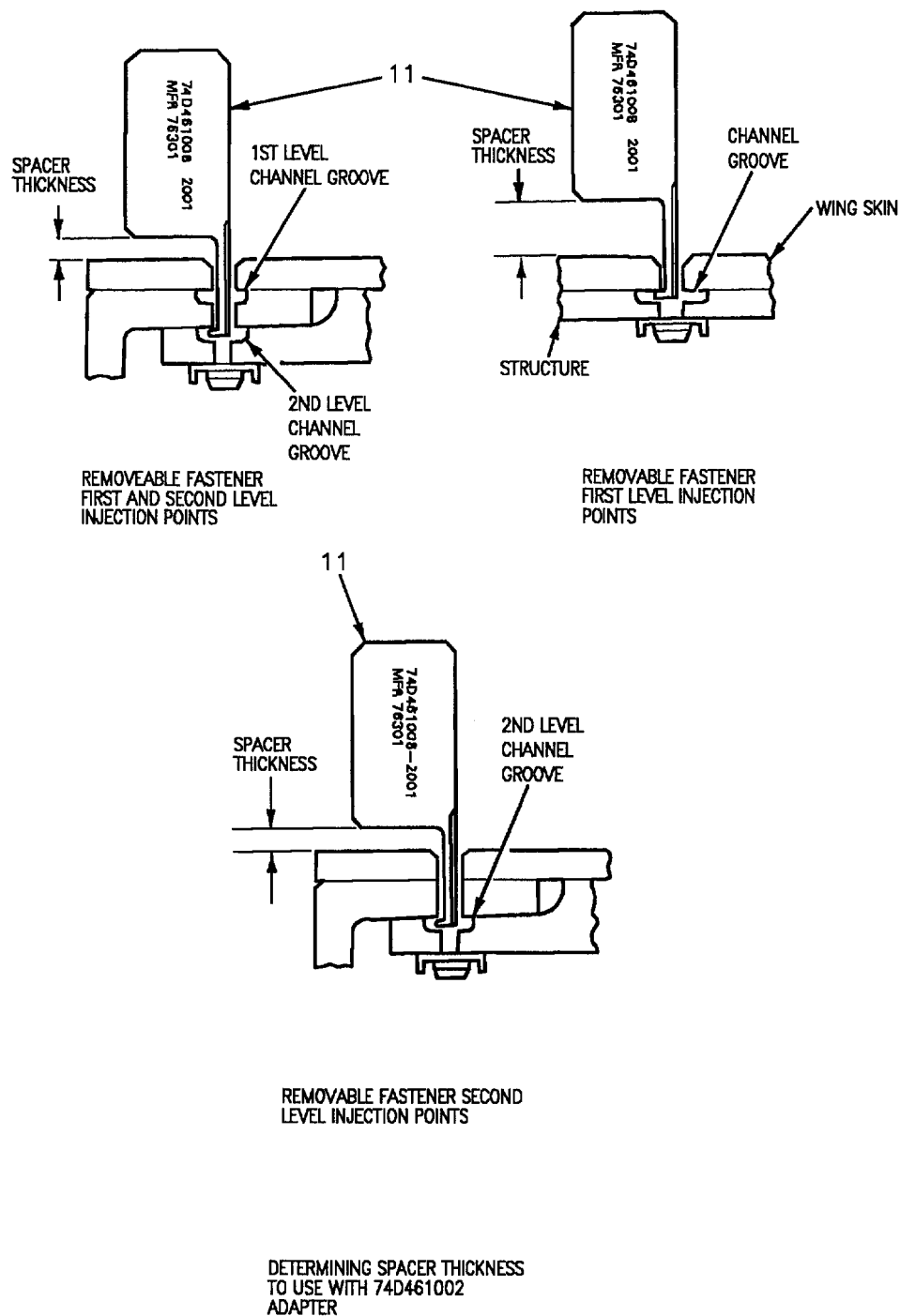


Figure 3. Sealant Injection Fitting and Adapter Installation (Sheet 2)






INDEX NO.	NOMENCLATURE	PART NUMBER
1	STRAIGHT FITTING	ST7M298-1 (M336) 
2	90° FITTING	ST7M298-2 (A358) 
3	45° FITTING	ST7M298-3 (A684) 
4	ADAPTER, HOLLOW SCREW	74D461054-2001
5	WASHER	74D461054-2003
6	ADAPTER, HOLLOW SCREW	74D461006-2001
7	ALLEN WRENCH, 1/16	TD481T3-1
8	SETSCREW	NAS1081C06A2
9	ADAPTER, OFFSET CHANNEL, UNTHREADED	74D461016-2005
10	SCREW	MS24693C26
11	GAGE, SPACER SELECTION	74D461008-2001
12	BOLT, EXTERNALLY RELIEVED BODY, OBSERVATION	74D461007-2001, -2003, -2005, -2007
13	SPACER	74D461003-2029, -2031
14	SPACER	74D461003-2001 THRU -2027
15	ADAPTER	74D461002-2013 THRU -2027
16	INJECTION PLUG	74A110949-2001
 ALEMITE DIVISION OF STEWART WARNER CORP. (95879)		
 TO PREVENT THREADED PART FROM BREAKING, DO NOT APPLY A SIDE LOAD WHEN INSTALLING ADAPTER.		

Figure 3. Sealant Injection Fitting and Adapter Installation (Sheet 3)

17. **SEALING COMPOUND INJECTION.** The steps below are for typical channel groove seal injection. See specific resealing paragraphs, for area to be resealed, to determine type of channel groove seal to be injected. For definitions of types of channel grooves, refer to Definitions, this WP.

18. Procedure for Sealing Compound Injection.

NOTE

Fuel leak must be isolated before starting sealing compound injection of channel groove.

Preferred sealing compound flow when injecting is from: outboard to inboard; down to up; or aft to forward.

If blind type repair fastener is found installed at injection point, inject sealing compound blind (having no observation hole) for 5 seconds from both sides of blind fastener.

a. Install adapters and observation bolt (if required) in injection and observation hole per Selection and Installation of Sealant Injection Adapters and Observation Bolt, this WP.



Sealing Compound

11



Sealing Compound

12

b. Trigger injection gun to extrude sealing compound until flow is smooth with no trapped air.



Reduce injection gun pressure to 35 ± 5 psi when no open sealant inspection point exists between injection point and sealant dam location to prevent damage to sealant dam. Ensure at least one additional closed injection point exists between the final injection point

and the sealant dam. Final "blind" injection is made with injection gun pressure set at 55 to 57 psi.

c. Install injection gun on injection adapter.



Be sure correct observation bolt is removed before injecting across dam gap seal to avoid damage to dam gap seal. For location of dam gap seals (WP018 01).

d. Trigger injection gun to inject sealing compound per substeps below:

(1) Press trigger for approximately 10 seconds.

(2) Release trigger for approximately 5 seconds or until a dull thump is heard or felt inside the injection gun. This thump indicates the bottoming out of the up piston travel in the recharging action.

NOTE

If flow is not obvious at the observation hole after approximately 1 minute or 6 ounces of sealing compound is injected between any 2 injection holes stop the injection and do substep (3) until flow is obvious.

(3) Check equipment per substeps below:

(a) Injection gun out of sealing compound.

(b) Injection gun in need of maintenance.

(c) Channel groove blocked due to FOD.

(d) Nonremovable fastener has more than one setscrew.

(e) Removable fastener adapter is set for incorrect depth.

(f) Observation hole not in same channel groove as injection hole.

(g) Sealing compound extruding to the exterior or interior of fuel tank rather than into the channel groove. Inspect fastener torque, or for damaged dam gap seal.

NOTE

Four press and release cycles of injection gun trigger per minute produces the best sealing compound flow rate.

If channel groove is blocked in the area of a leak, repairs can be made by injecting sealing compound from both sides of blockage.

(4) Repeat pressing and releasing of trigger until approximately 1 inch of clean, dry, free of entrapped air, free of fuel, free of contaminants sealing compound flows smoothly from observation hole.

(5) If sealing compound from observation hole contains fuel, contaminants, or air, move one more injection fastener away from leak, and install adapter per Selection and Installation of Sealant Injection Adapters and Observation Bolt, this WP.

(6) Repeat injection, steps (4) and (5) until sealing compound from observation hole is clean and dry. (Not applicable to fuel tank fitting or pylon door channel groove seals).

e. Carefully remove injection gun or hose assembly from adapter.

NOTE

Sealing compound backing out of injection point hole due to back pressure is a sign of a good channel groove with no damaged dam gap seals or leaks into fuel tanks.

Replacement of injection point fastener immediately after sealing compound injection will maintain sealing compound back pressure for a good seal.

f. Remove adapter, reinstall injection plug screw, or setscrew in nonremovable fastener until flush. Reinstall, seal, and torque removable fastener (WP018 00).

g. Remove observation bolt from observation hole, if installed, and install adapter per Selection and Installation of Sealant Injection Adapters and Observation Bolt, this WP.

h. Remove next injection fastener in direction of sealing compound flow for use as observation hole, and install observation bolt (if required).

i. Repeat injection/observation cycle, steps c through h, until 2 injection fasteners past leak and sealing compound flow from observation hole is clean.



Ensure at least one additional closed injection point exists between the final injection point and the sealant dam. Final "blind" injection to be made with the injection gun pressure set at 55 to 57 psi.

j. Install adapter in last observation hole and inject sealing compound blind (having no observation hole) for 5 seconds.

k. Disconnect injection gun from air source and adapter.

l. Remove adapter and reinstall removable fastener or setscrew in nonremovable fastener in last injection hole. Install setscrew flush with nonremovable fastener head.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

m. Remove excess sealing compound from wing skin, injection gun, and adapter set components with rymple cloth and isopropyl alcohol.

n. Replace caps on hose assembly.

o. Inspect resealed area for leaks.

19. Emergency Sealing Compound Injection. When conditions require quick turn-around time, and defueling the aircraft is not possible, removable fasteners may be reinjected per steps below:

NOTE

Keep fuel spillage to a minimum by covering fastener hole, and quickly inserting injection adapter or fastener, wiping up fuel immediately.

a. Remove fastener.

b. Install injection adapter.



Sealing Compound

11



Sealing Compound

12

c. Attach injection gun or hose assembly to adapter and inject blind (having no observation hole) for 5 seconds.

d. Remove injection gun or hose assembly from injection adapter.

e. Remove adapter and quickly reinstall fastener.

f. Seal and torque fastener (WP018 00).

20. SPECIFIC RESEALING PROCEDURES.

21. The paragraphs below are procedures for specific channel groove seal areas. Each paragraph will cover steps unique to its designated area. General Re-sealing Procedures, this WP, will be referred to for injection procedures typical for channel groove seals. See figure 4 for channel groove seal index.

Support Equipment Required

None

Materials Required

None

NOTE

If a permanent repair fastener is found at an injection point, move away from leak to next injection point fastener and inject across repair fastener to next observation hole.

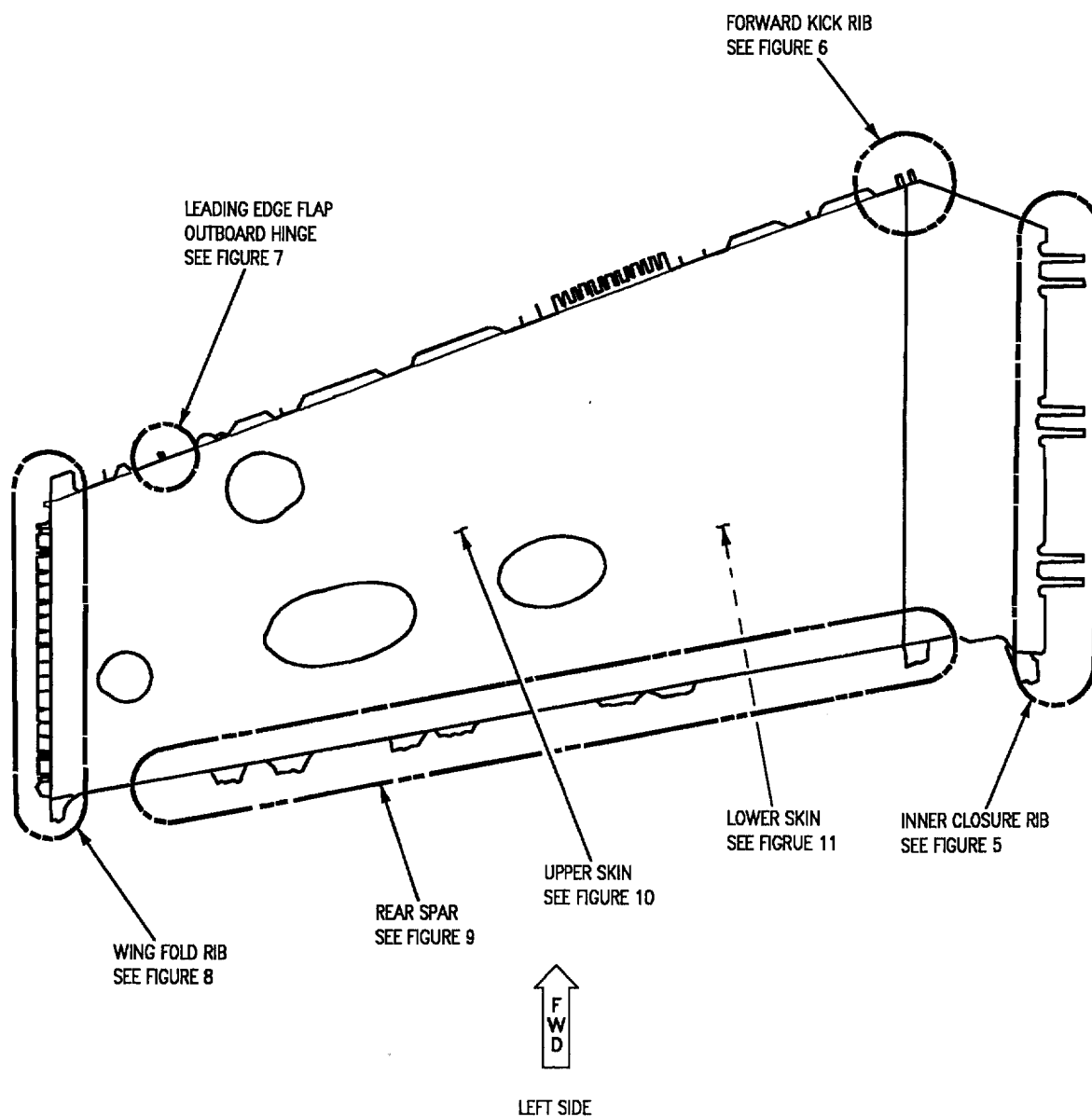


Figure 4. Channel Groove Seal Index

22. CLOSURE RIB CHANNEL GROOVE SEAL INJECTION. See figure 5.



Be sure correct observation bolt is removed when injecting across a recently repaired dam gap seal to avoid damage to dam gap seal.

23. Straight Run Injection.

a. Remove access door 41L (or 41R) (A1-F18AC-LMM-010).

b. Prepare sealing compound injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

c. Find injection point 2 injection fasteners aft of leak, and inject channel groove sealing compound per Sealing Compound Injection, this WP.

d. Install access door 41L (or 41R) (A1-F18AC-LMM-010).

24. Fuel Tank Fitting Injection.

a. Remove access door 41L (or 41R) (A1-F18AC-LMM-010).

b. Prepare sealing compound injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

c. For fittings with only 2 injection fasteners:

(1) Remove 1 injection fastener and install adapter per Selection and Installation of Sealant Injection Adapters and Observation Bolt, this WP.

(2) Remove other injection fastener for observation hole. Install observation bolt (12, figure 3) hand tight, if required.

(3) Inject channel groove sealing compound per Sealing Compound Injection, this WP.

d. For fittings with 3 injection fastener:

(1) Remove 1 injection fastener and install adapter per Selection and Installation of Sealant Injection Adapters and Observation Bolt, this WP.

(2) Remove next injection fastener for observation hole. Install observation bolt (12, figure 3), handtight, if required.

(3) Inject channel groove sealing compound per Sealing Compound Injection, this WP.

(4) Leave first injection fastener out and remove observation bolt.

(5) Install adapter into observation hole and remove next injection fastener for second observation hole. Install observation bolt, if required.

(6) Inject channel groove sealing compound per Sealing Compound Injection, this WP.

(7) Remove adapter and install injection fastener. Remove observation bolt, if installed.

(8) Install adapter into second observation hole and use first injection hole for third observation hole. Install observation bolt, if required.

(9) Inject channel groove sealing compound per Sealing Compound Injection, this WP.

(10) Remove adapter and install injection fastener. Remove observation bolt, if installed.

(11) Reinject first injection hole blind for 5 seconds.

(12) Remove adapter and install injection fastener.

e. Install access door 41L (or 41R) (A1-F18AC-LMM-010).

25. Forward Wrap Around Injection.

a. Remove access doors 41L (or 41R) and 34L (or 34R) (A1-F18AC-LMM-010).

b. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

c. For upper wrap around, see view A:

(1) Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at hole "C" with hole "B" being observation hole.

(2) Continue injection/observation cycle until hole "A" to complete wrap around to second level channel groove.

(3) Inject first level channel groove seal at hole "D" with hole "E" being observation hole.

(4) Inject hole "E" blind for 5 seconds.

d. For lower wrap around, see view B:

(1) Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at hole "C," or hole "D," if hole "C" is not applicable, with hole "B" being observation hole.

(2) Continue injection/observation cycle until hole "A" or hole "E," as applicable, to complete wrap around to second level channel groove.

(3) Inject first level channel groove seal at hole "A" or hole "E," as applicable, with hole "F" being observation hole.

(4) Inject hole "F" blind for 5 seconds.

e. Install access doors 41L (or 41R) and 34L (or 34R) (A1-F18AC-LMM-010).

26. Aft Wrap Around Injection.

a. Remove access door 41L (or 41R) (A1-F18AC-LMM-010).

b. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

c. For upper wrap around, see view C:

(1) Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at hole "C" with hole "B" being observation hole.

(2) Continue injection/observation cycle until hole "A" to complete wrap around to second level channel groove.

(3) Inject first level channel groove seal at "D" with hole "E" being observation hole.

(4) Inject hole "E" blind for 5 seconds.

d. For lower wrap around, see view D:

(1) Inject channel groove sealing compound per paragraph 17, starting at hole "C" with hole "B" being observation hole.

(2) Continue injection/observation cycle until hole "A" to complete wrap around to second level channel groove.

(3) Inject first level channel groove seal at hole "D" only, blind for 5 seconds.

e. Install access doors 41L (or 41R) (A1-F18AC-LMM-010).

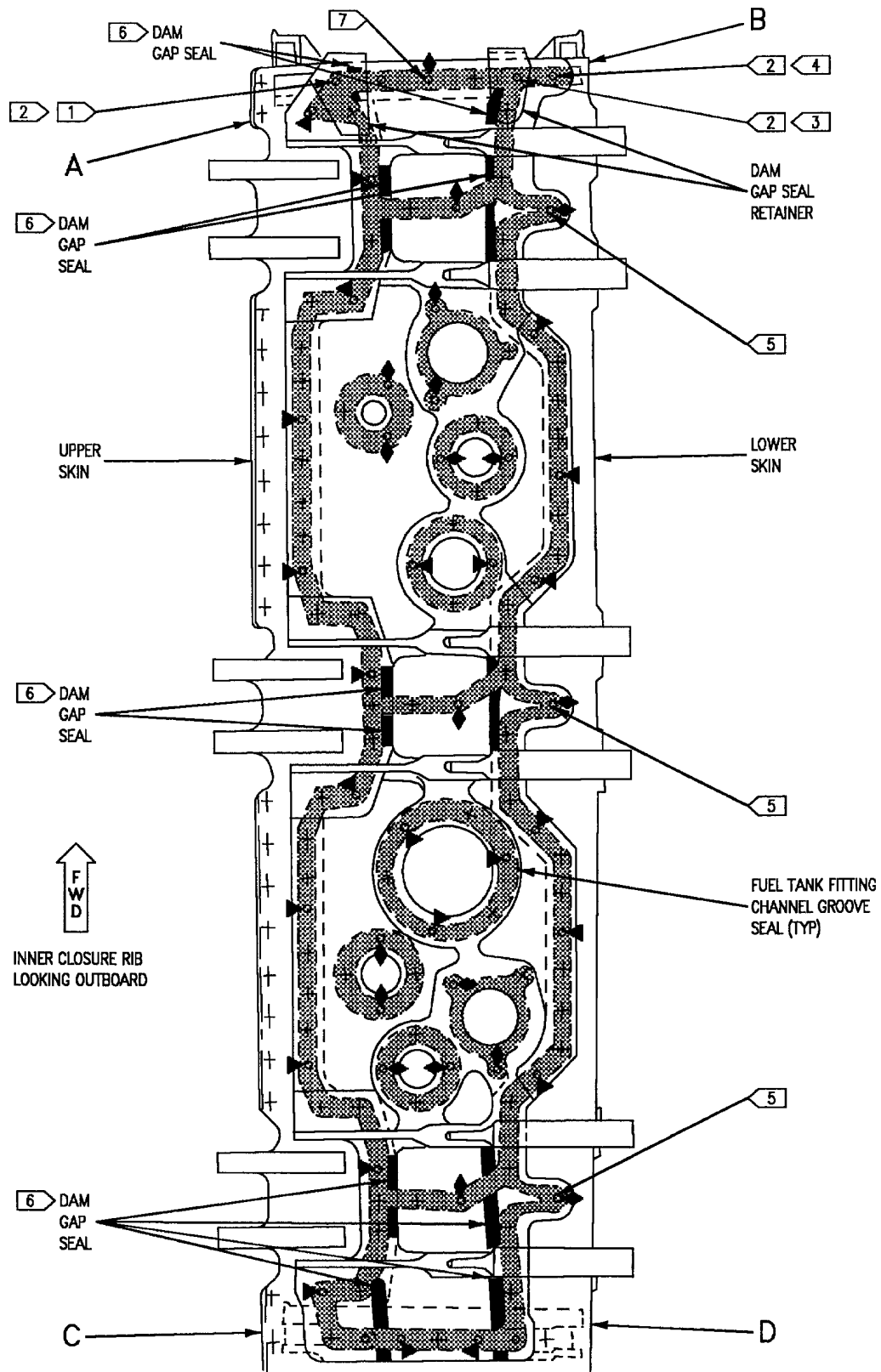
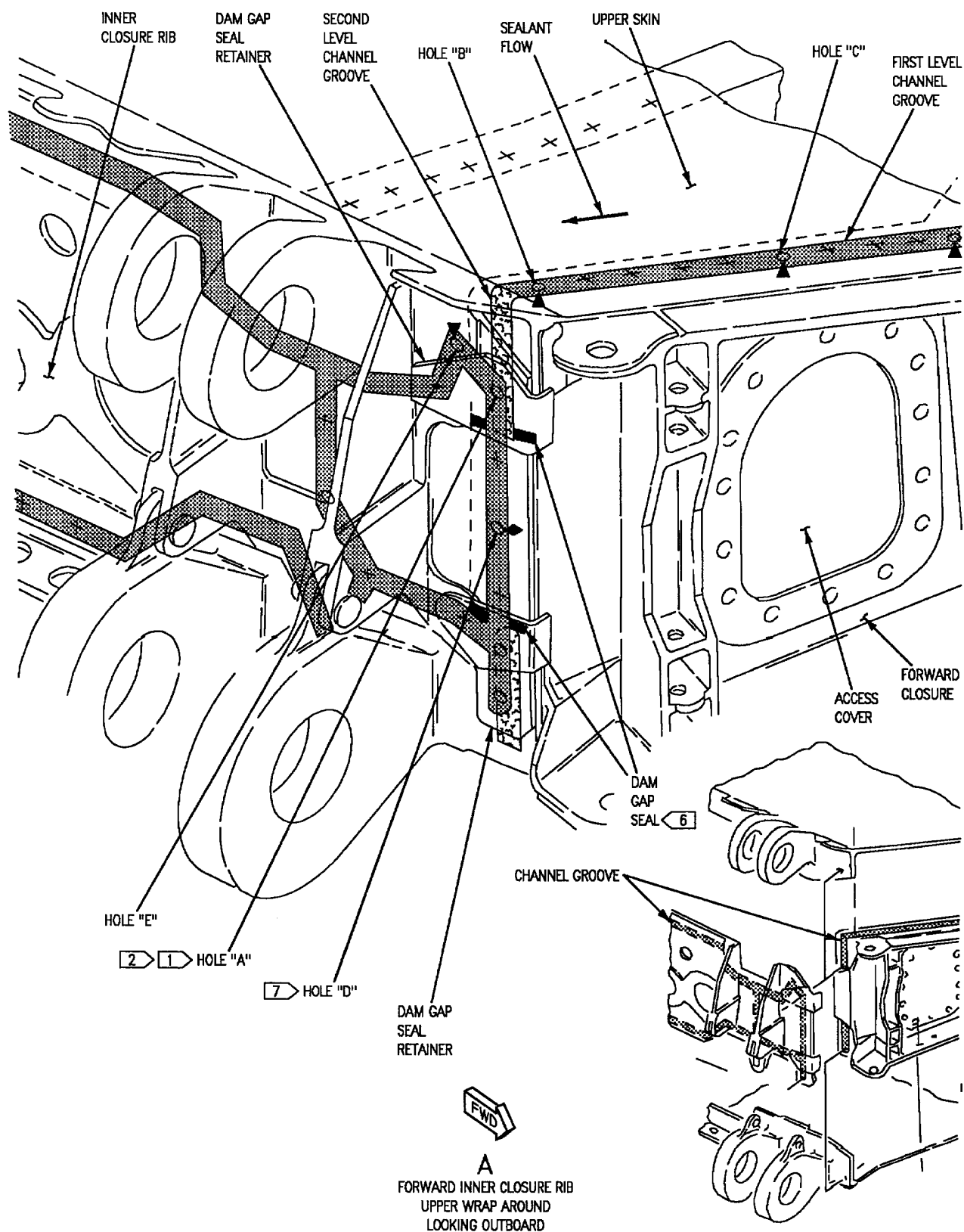


Figure 5. Closure Rib Channel Groove Seal Injection (Sheet 1)



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Figure 5. Closure Rib Channel Groove Seal Injection (Sheet 2)

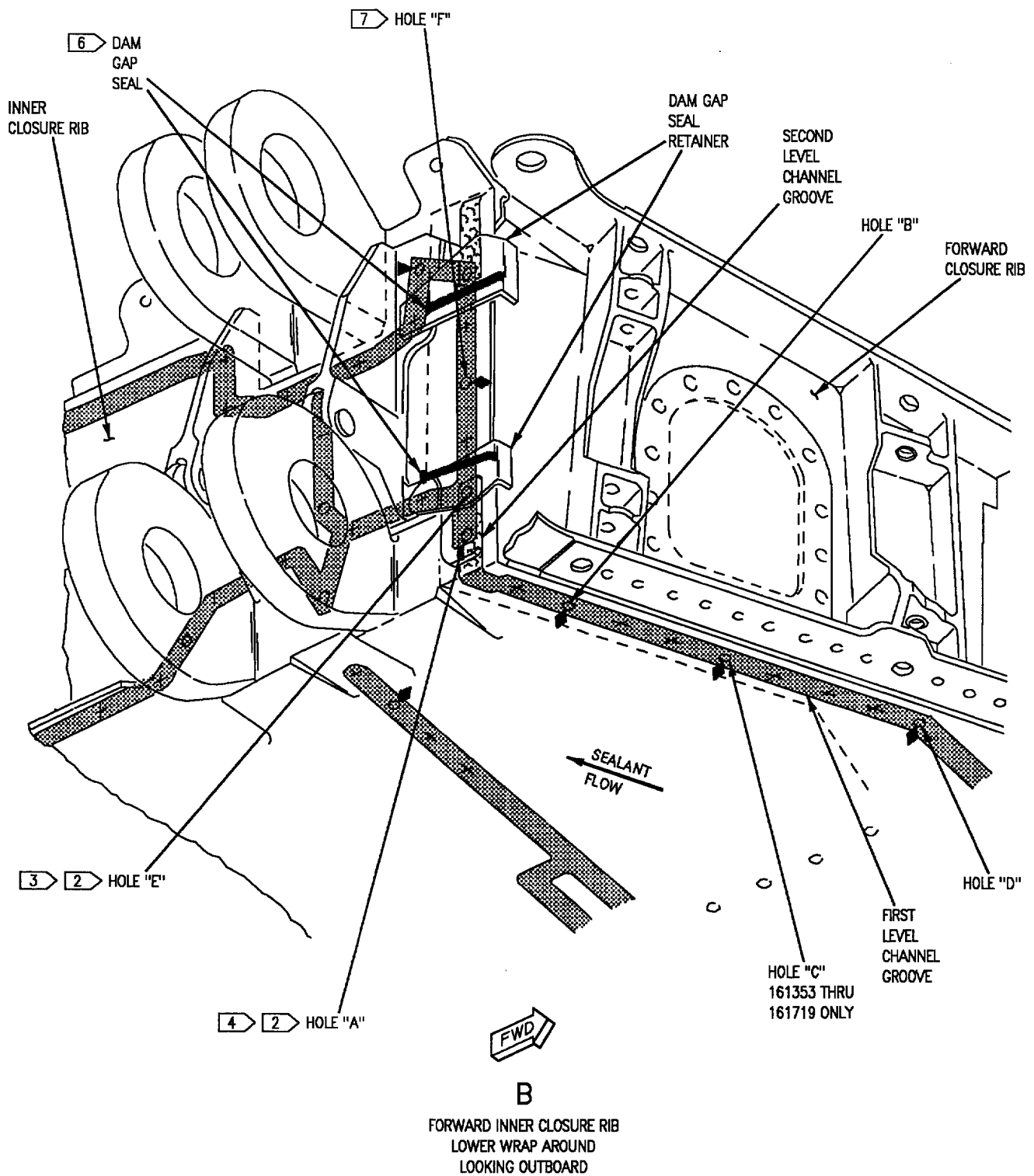


Figure 5. Closure Rib Channel Groove Seal Injection (Sheet 3)

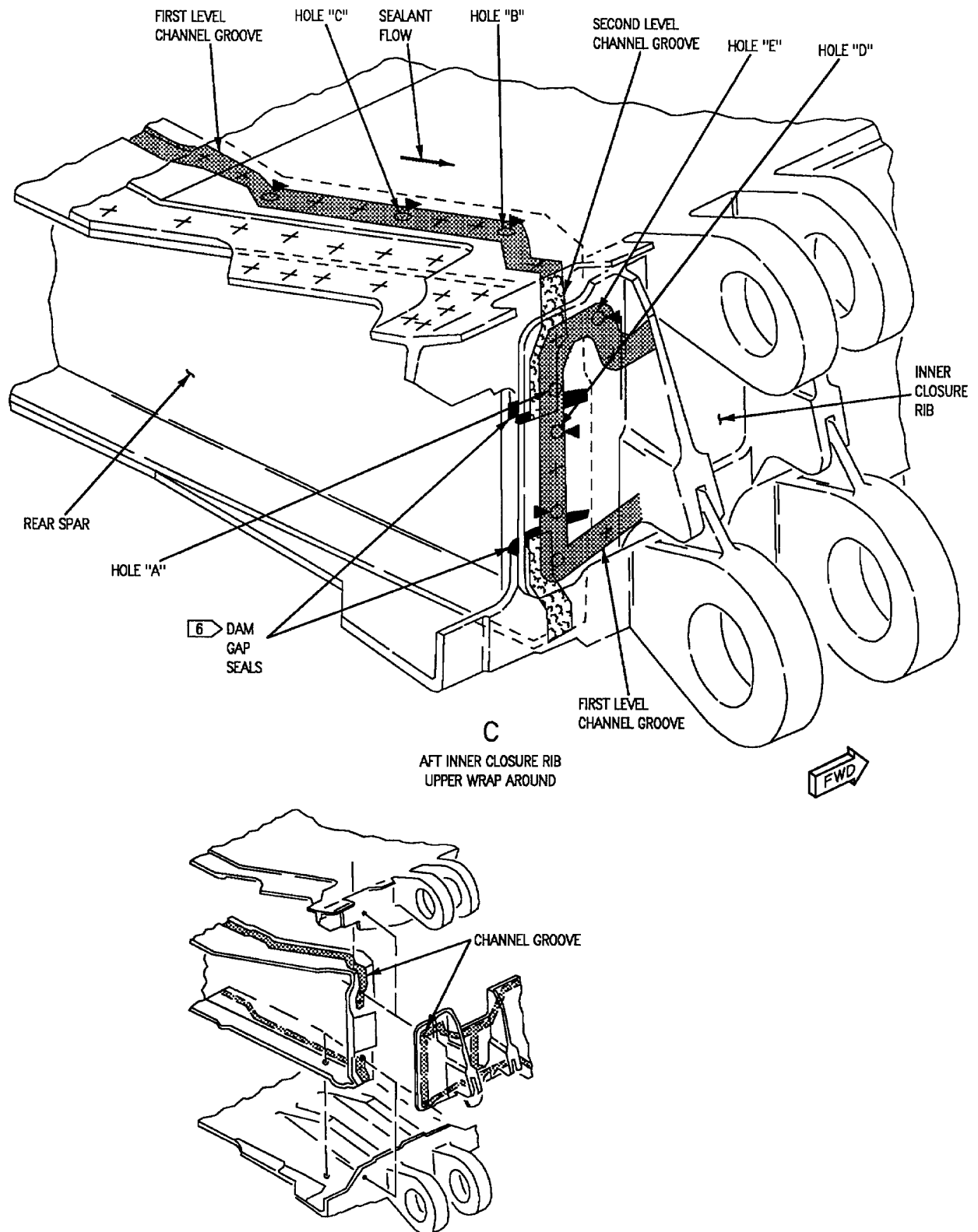


Figure 5. Closure Rib Channel Groove Seal Injection (Sheet 4)

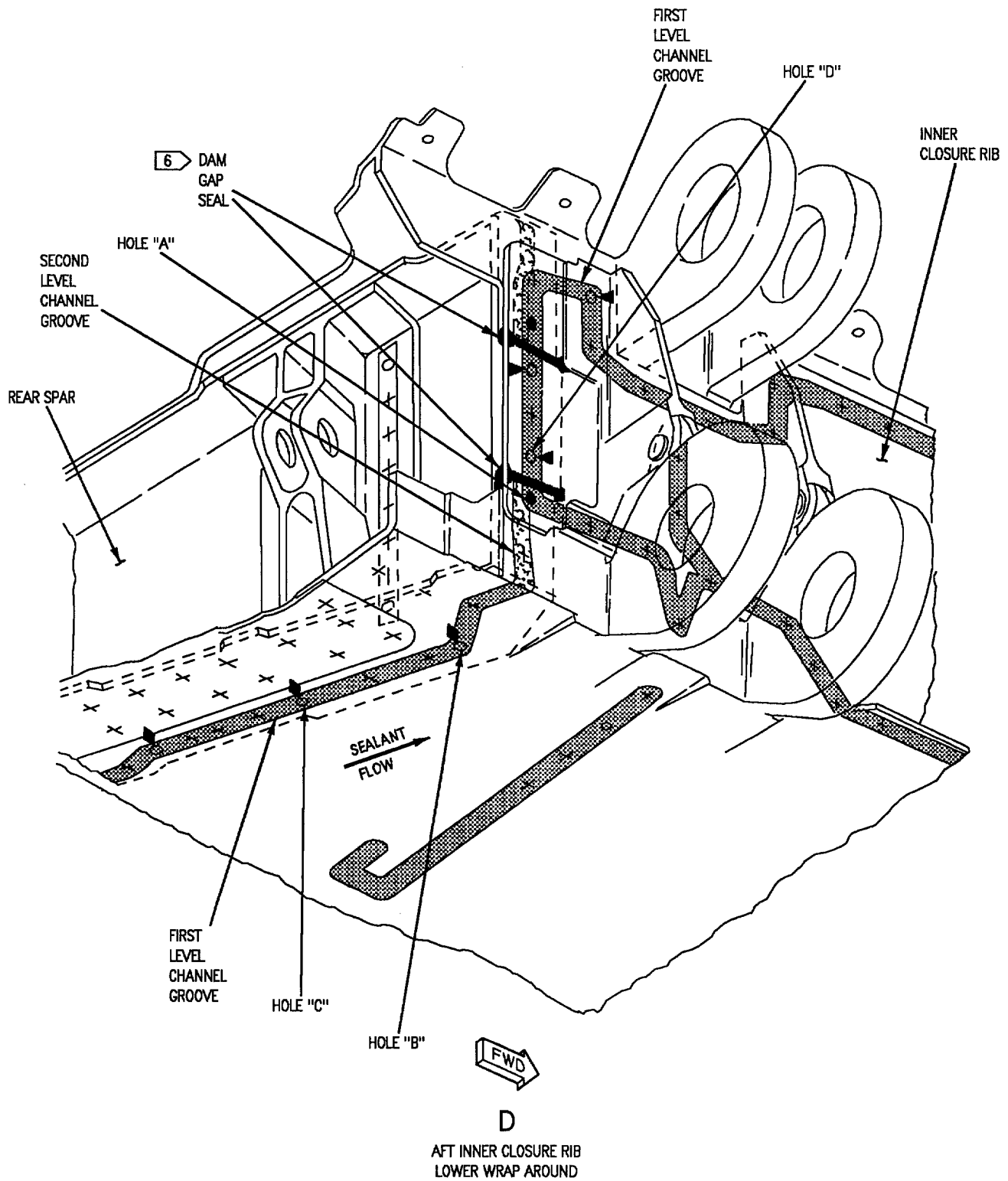


Figure 5. Closure Rib Channel Groove Seal Injection (Sheet 5)

LEGEND

- + REFERENCE FASTENER
- REMOVABLE FASTENER SECOND LEVEL INJECTION POINT
- ▶○ REMOVABLE FASTENER FIRST LEVEL INJECTION POINT
- ◆● PERMANENT FASTENER SECOND LEVEL INJECTION POINT
- ◆○ PERMANENT FASTENER FIRST LEVEL INJECTION POINT
- ▶●○ REMOVABLE FASTENER FIRST & SECOND LEVEL INJECTION POINT
- DAM GAP SEAL
- 1 LEFT SIDE 161353 AND UP RIGHT SIDE 161353 THRU 161520 ●;RIGHT SIDE 161521 AND UP. ▶●○
- 2 CAUTION SHOULD BE TAKEN WHEN REINSTALLING INJECTION HOLE FASTNER TO PREVENT MOVEMENT OR LOSS OF NUT ELEMENT.
- 3 161353 THRU 161520 ◆●;RIGHT SIDE 161521 AND UP. ●
- 4 LEFT SIDE 161353 AND UP, RIGHT SIDE 161353 THRU 161520 ◆○;RIGHT SIDE 161521 AND UP. ▶●○
- 5 CANNOT INJECT WHEN WING IS ATTACHED TO FUSELAGE.
- 6 WHEN INJECTING SEALANT IN DAM GAP AREA IT IS CRITICAL THAT CORRECT OBSERVATION HOLE IS USED.
- 7 RIGHT SIDE 161521 AND UP, OMIT INJECTION FASTENER SET SCREW TO PREVENT OVER-PRESSURIZATION OF DAM GAP SEALS.

Figure 5. Closure Rib Channel Groove Seal Injection (Sheet 6)

27. KICK RIB CHANNEL GROOVE SEAL INJECTION. See figure 6.

Be sure correct observation bolt is removed when injecting across a recently repaired dam gap seal to avoid damage to dam gap seal.

NOTE

Access to closure rib/forward spar injection fasteners will be improved by removing the leading edge flap angle drive unit and flap drive shaft but is not required for resealing.

28. Forward Kick Rib Upper Wrap Around. See figure 6, sheet 1.

a. Remove doors 193L (or 193R) and 34L (or door 34R) (A1-F18AC-LMM-010).

b. Remove flap angle drive unit, if required (A1-F18AC-570-300, WP037 00).

c. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

d. Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at hole "C" with hole "A" being observation.

e. Continue with injection/observation cycle at hole "A" and hole "B," then hole "B" and hole "D" to complete wrap around injection.

f. Inject hole "D" blind for 5 seconds.

g. Install flap angle drive unit, if removed (A1-F18AC-570-300, WP037 00).

h. Install doors 193L (or 193R) or 34L (or 34R) (A1-F18AC-LMM-010).

29. Forward Kick Rib Lower Wrap Around. See figure 6, details A and B.

a. Remove doors 197L (or 197R) and 113L (or 113R) (A1-F18AC-LMM-010).

b. Remove flap angle drive unit, if required (A1-F18AC-570-300, WP037 00).

c. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

d. Inject channel groove sealing compound per paragraph 17, starting at hole "D" with hole "F" being observation.

e. Continue with injection/observation cycle at hole "F" and hole "E," then hole "E" and hole "C" to complete wrap around injection.

f. Inject hole "C" blind for 5 seconds.

g. For 161353 THRU 161520, view A:

(1) Inject first level channel groove at hole "J" with hole "H" being observation hole.

(2) Reinstall setscrew in hole "J."

(3) Inject at hole "G" with hole "H" being observation hole.

(4) Inject hole "H" blind for 5 seconds.

h. For 161521 AND UP, view B:

(1) Inject first level channel groove at hole "G" with hole "H" being observation hole.

(2) Inject hole "H" blind for 5 seconds.

i. Install flap angle drive unit, if removed (A1-F18AC-570-300, WP037 00).

j. Install doors 197L (or 197R) and 113L (or 113R) (A1-F18AC-LMM-010).

30. Hydraulic Fitting First Level. See figure 6, sheet 1.

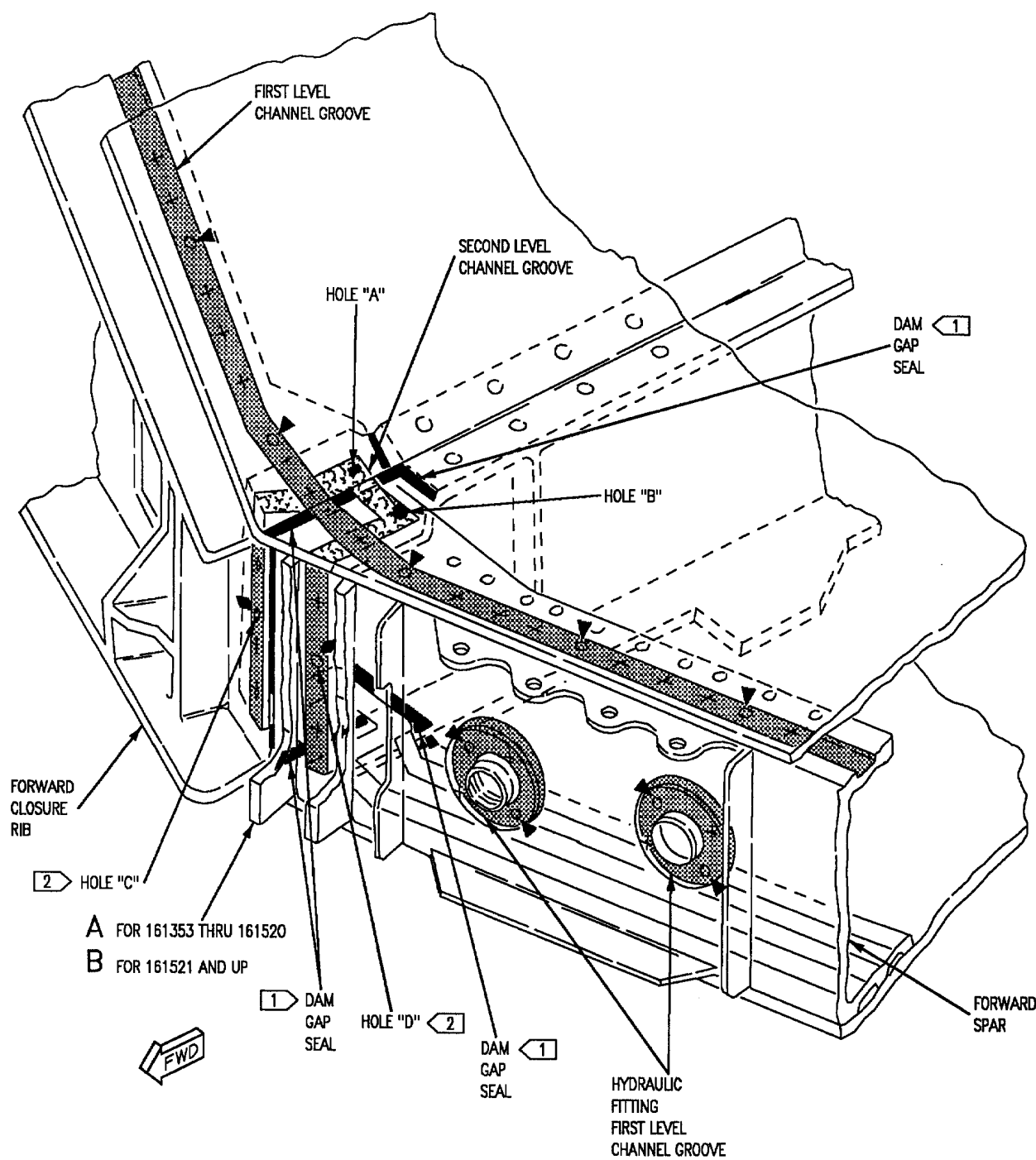
a. Remove door 197L (or 197R) (A1-F18AC-LMM-010).

b. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

c. Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at either hole, with the other hole being observation.

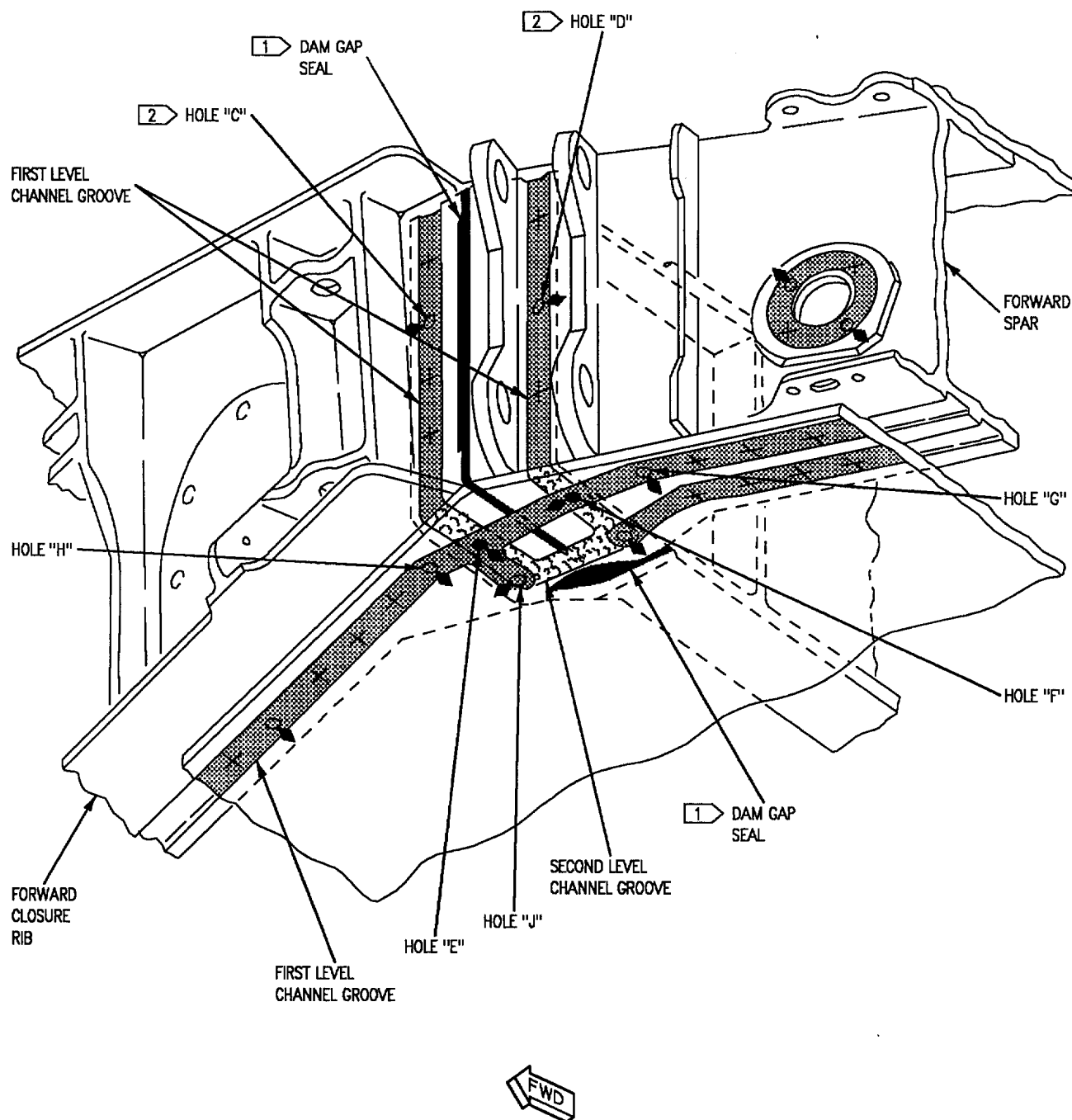
d. Inject observation hole blind for 5 seconds.

e. Install door 197L (or 197R) (A1-F18AC-LMM-010).



FORWARD KICK RIB UPPER WRAP AROUND
LOOKING INBOARD

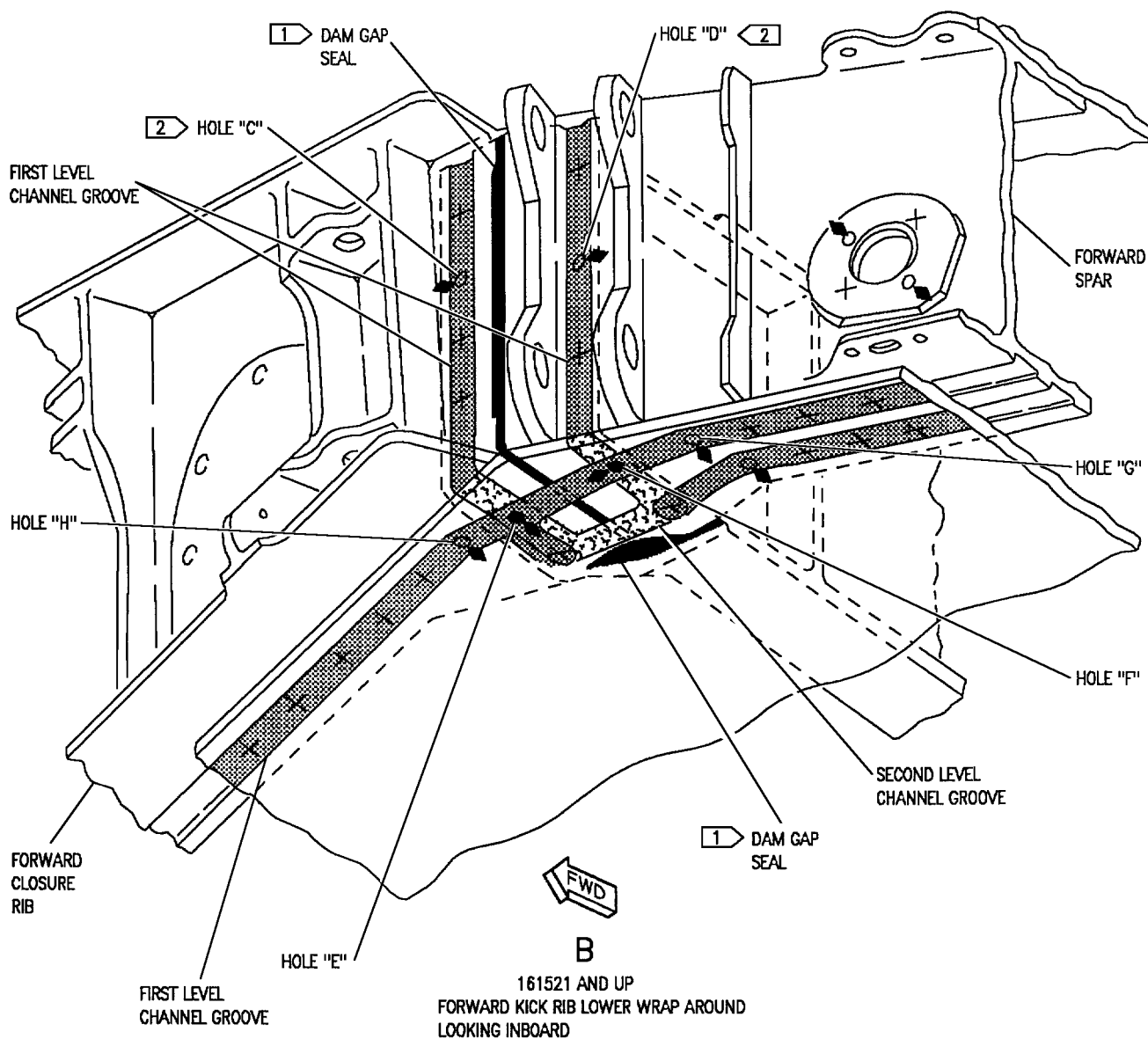
Figure 6. Kick Rib Channel Groove Seal Injection (Sheet 1)



A

161353 THRU 161520
FORWARD KICK RIB LOWER WRAP AROUND
LOOKING INBOARD

Figure 6. Kick Rib Channel Groove Seal Injection (Sheet 2)



LEGEND

- + REFERENCE FASTENER
- REMOVABLE FASTENER SECOND LEVEL INJECTION POINT
- ▶○ REMOVABLE FASTENER FIRST LEVEL INJECTION POINT
- ◆● PERMANENT FASTENER SECOND LEVEL INJECTION POINT
- ◆○ PERMANENT FASTENER FIRST LEVEL INJECTION POINT
- DAM GAP SEAL
- 1 WHEN INJECTING SEALANT IN DAM GAP AREA IT IS CRITICAL THAT CORRECT OBSERVATION HOLE IS USED.
- 2 161521 AND UP, OMIT INJECTION FASTENER SETSCREW TO PREVENT OVERPRESSURIZATION OF DAM GAP SEALS.

Figure 6. Kick Rib Channel Groove Seal Injection (Sheet 3)

31. LEADING EDGE FLAP OUTBOARD HINGE CHANNEL GROOVE SEAL INJECTION. See figure 7.

a. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

b. Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at hole "A" on lower skin, with hole "B" on upper skin being observation hole.

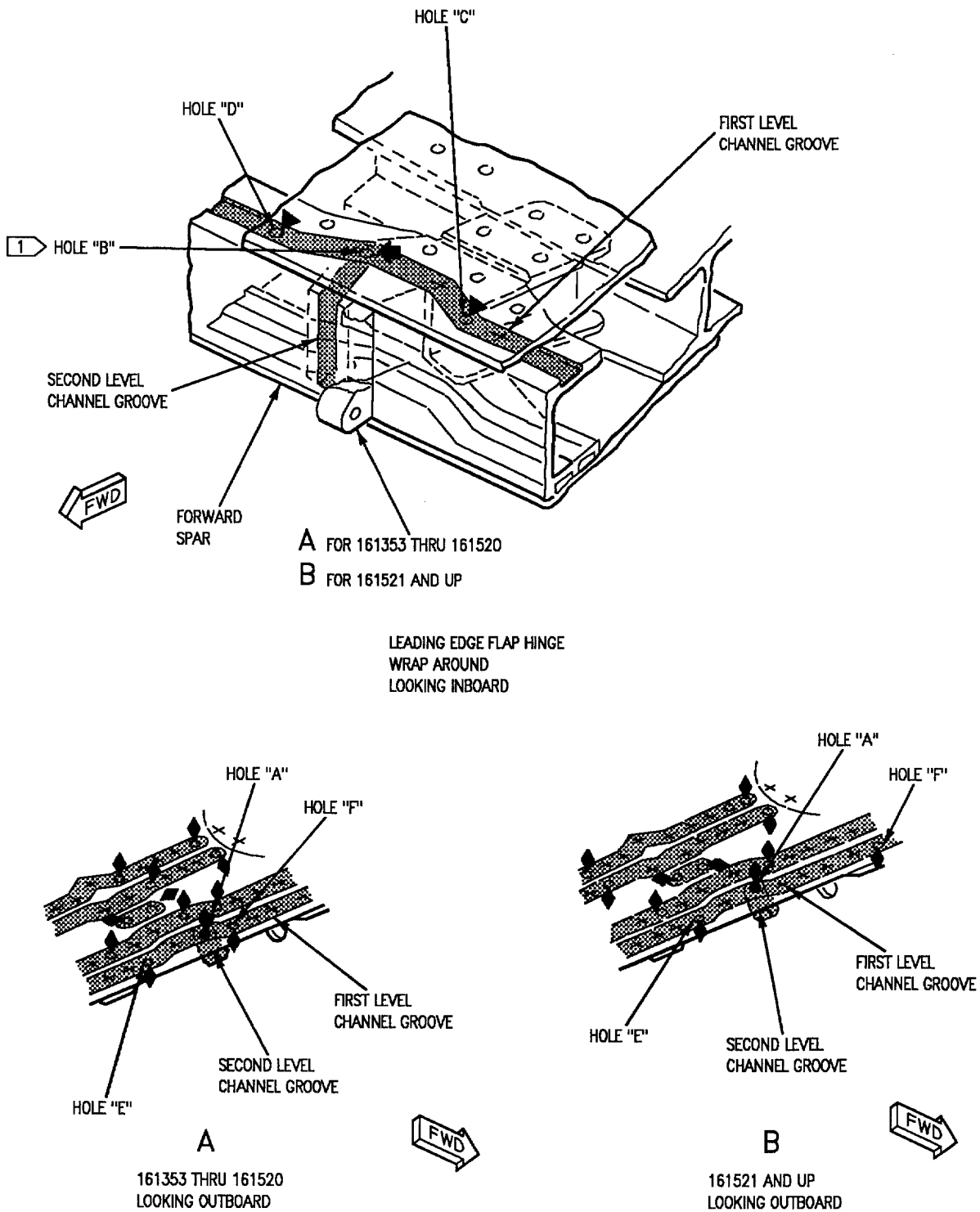
c. Inject hole "B" blind for 5 seconds.

d. Inject upper skin first level channel groove at hole "C" with hole "D" being observation hole.

e. Inject hole "D" blind for 5 seconds.

f. Inject lower skin first level channel groove at hole "E" with hole "F" being observation hole, views A and B.








g. Inject hole "F" blind for 5 seconds.



01900701

Figure 7. Leading Edge Outboard Hinge Channel Groove Seal Injection (Sheet 1)

LEGEND

-  REFERENCE FASTENER
-  REMOVABLE FASTENER FIRST LEVEL INJECTION POINT
-  PERMANENT FASTENER SECOND LEVEL INJECTION POINT
-  PERMANENT FASTENER FIRST LEVEL INJECTION POINT
-  REMOVABLE FASTENER FIRST & SECOND LEVEL INJECTION POINT
-  DAM GAP SEAL
-  CAUTION SHOULD BE TAKEN WHEN REINSTALLING INJECTION HOLE FASTENER TO PREVENT MOVEMENT OR LOSS OF NUT ELEMENT.

01900702

Figure 7. Leading Edge Outboard Hinge Channel Groove Seal Injection (Sheet 2)

32. WING FOLD RIB CHANNEL GROOVE SEAL INJECTION. See figure 8.

a. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

b. Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at hole "A" on lower skin with hole "B" on upper skin being observation hole.

c. Continue with injection/observation cycle until last hole in wrap around channel.

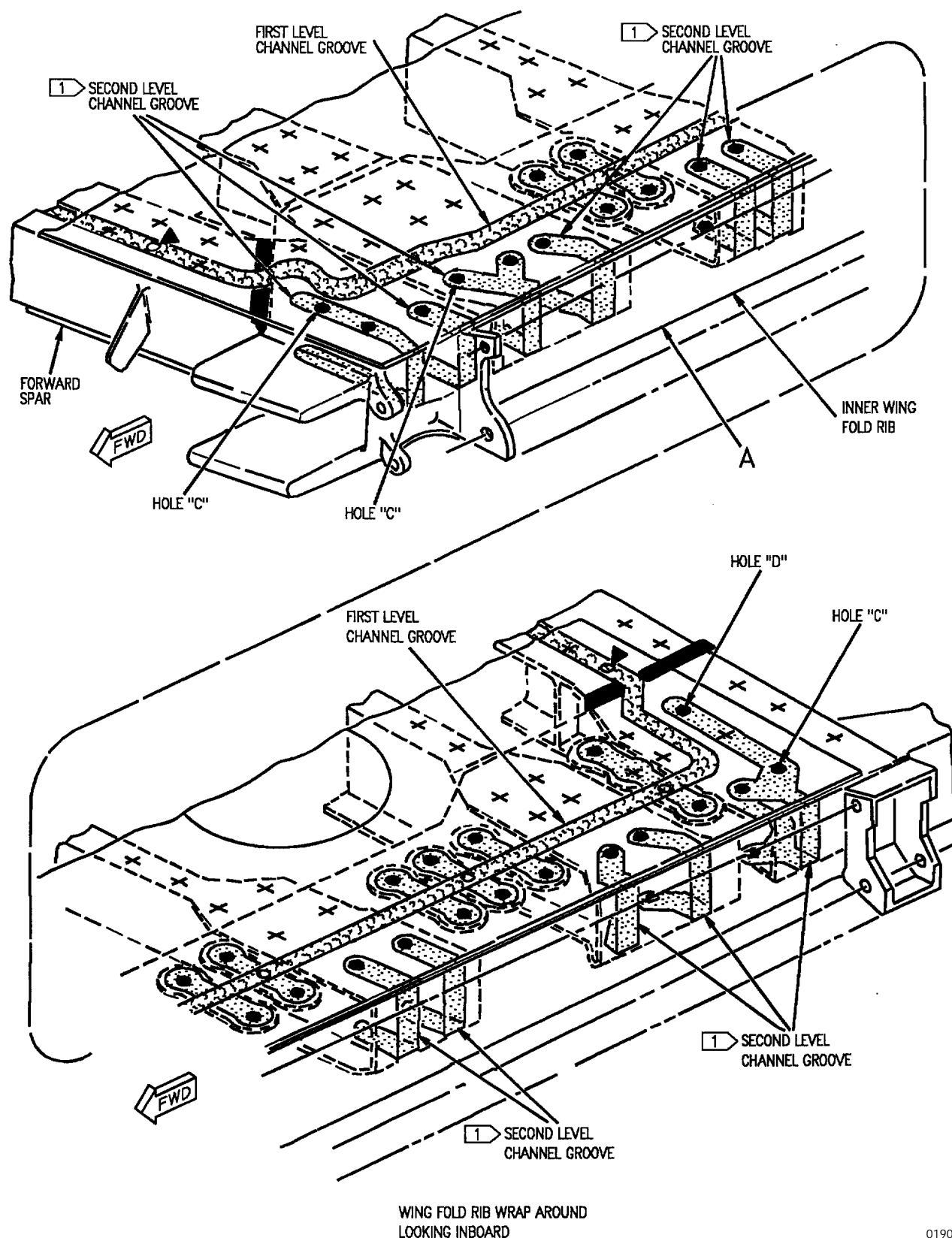
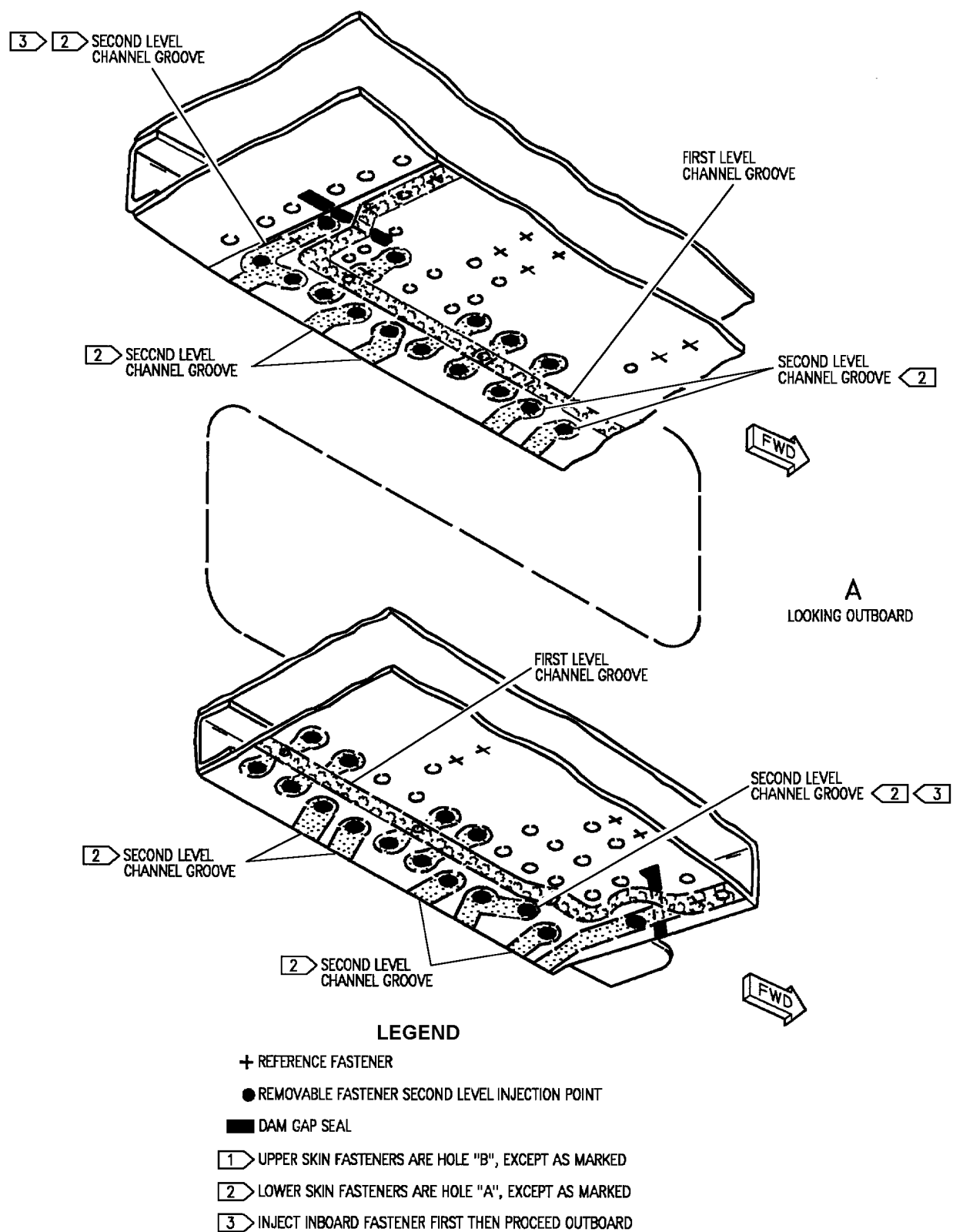


Figure 8. Wing Fold Rib Channel Groove Seal Injection (Sheet 1)



01900802

Figure 8. Wing Fold Rib Channel Groove Seal Injection (Sheet 2)

33. **REAR SPAR CHANNEL GROOVE SEAL INJECTION.** See figure 9.

34. **First Level Channel Groove.** See views A, B, C, and F.

a. Remove doors 78L (or 78R) and 79L (or 79R) (A1-F18AC-LMM-010).

b. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

c. Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at hole "A" with hole "B" being observation hole.

35. **Wrap Around Channel Groove.** See views C and G.

a. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

b. Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at hole "A" on lower skin, with hole "B" on upper skin being observation.

c. Inject hole "B" blind for 5 seconds.

d. Inject upper skin first level channel groove at hole "C" with hole "D" being observation, views C and G.

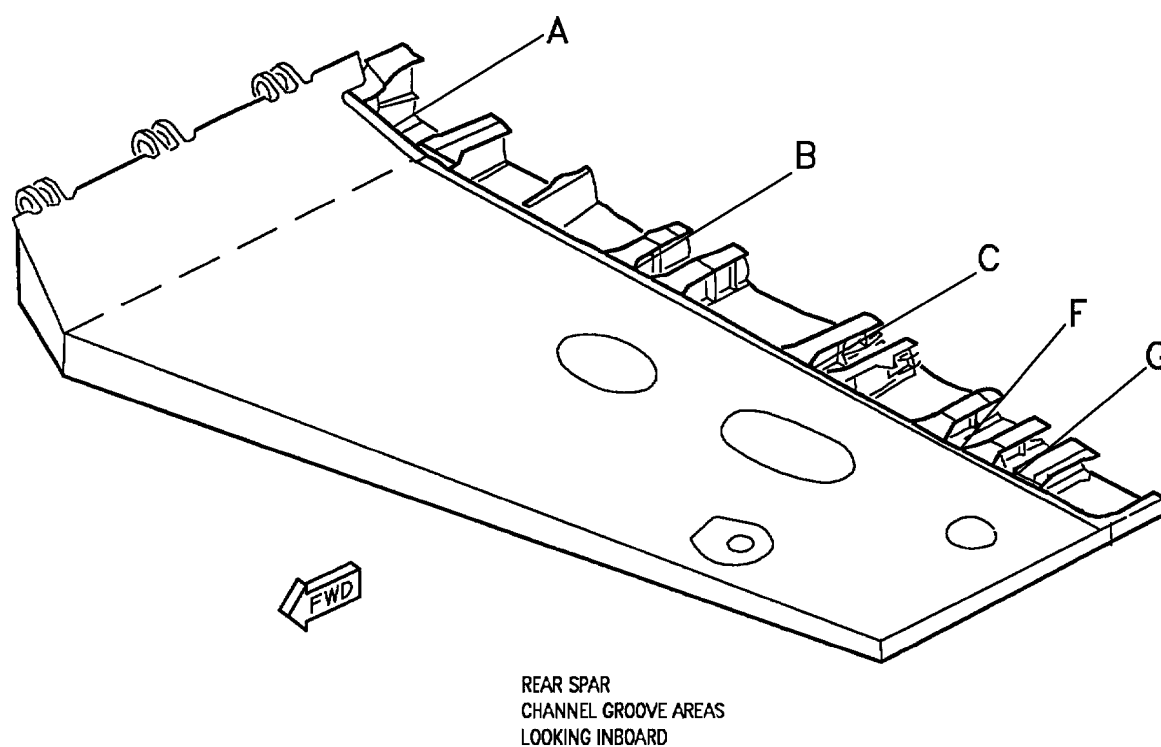
e. Repeat injection/observation cycle until one first level fastener past wrap around.

f. Inject last observation hole blind for 5 seconds.

g. Inject lower skin first level channel groove starting at outboard injection fastener with next inboard injection fastener being observation hole, views D, E, H, and J as applicable.

h. Repeat injection/observation cycle until one first level fastener past wrap around.

i. Inject last observation hole blind for 5 seconds.



LEGEND

- + REFERENCE FASTENER
- REMOVABLE FASTENER SECOND LEVEL INJECTION POINT
- ▶○ REMOVABLE FASTENER FIRST LEVEL INJECTION POINT
- ◆● PERMANENT FASTENER SECOND LEVEL INJECTION POINT
- ◆○ PERMANENT FASTENER FIRST LEVEL INJECTION POINT
- DAM GAP SEAL

Figure 9. Rear Spar Channel Groove Seal Injection (Sheet 1)

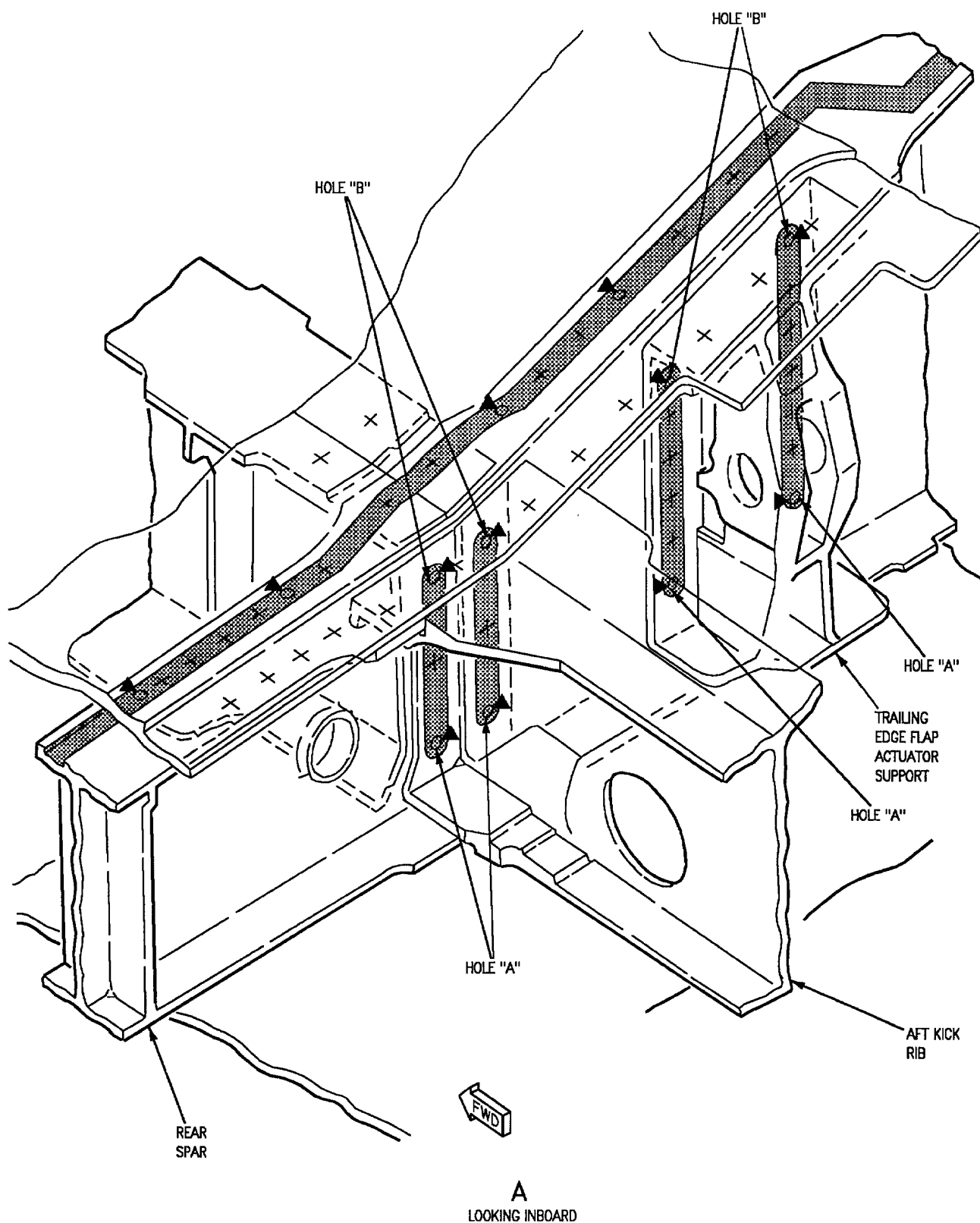


Figure 9. Rear Spar Channel Groove Seal Injection (Sheet 2)

01900902

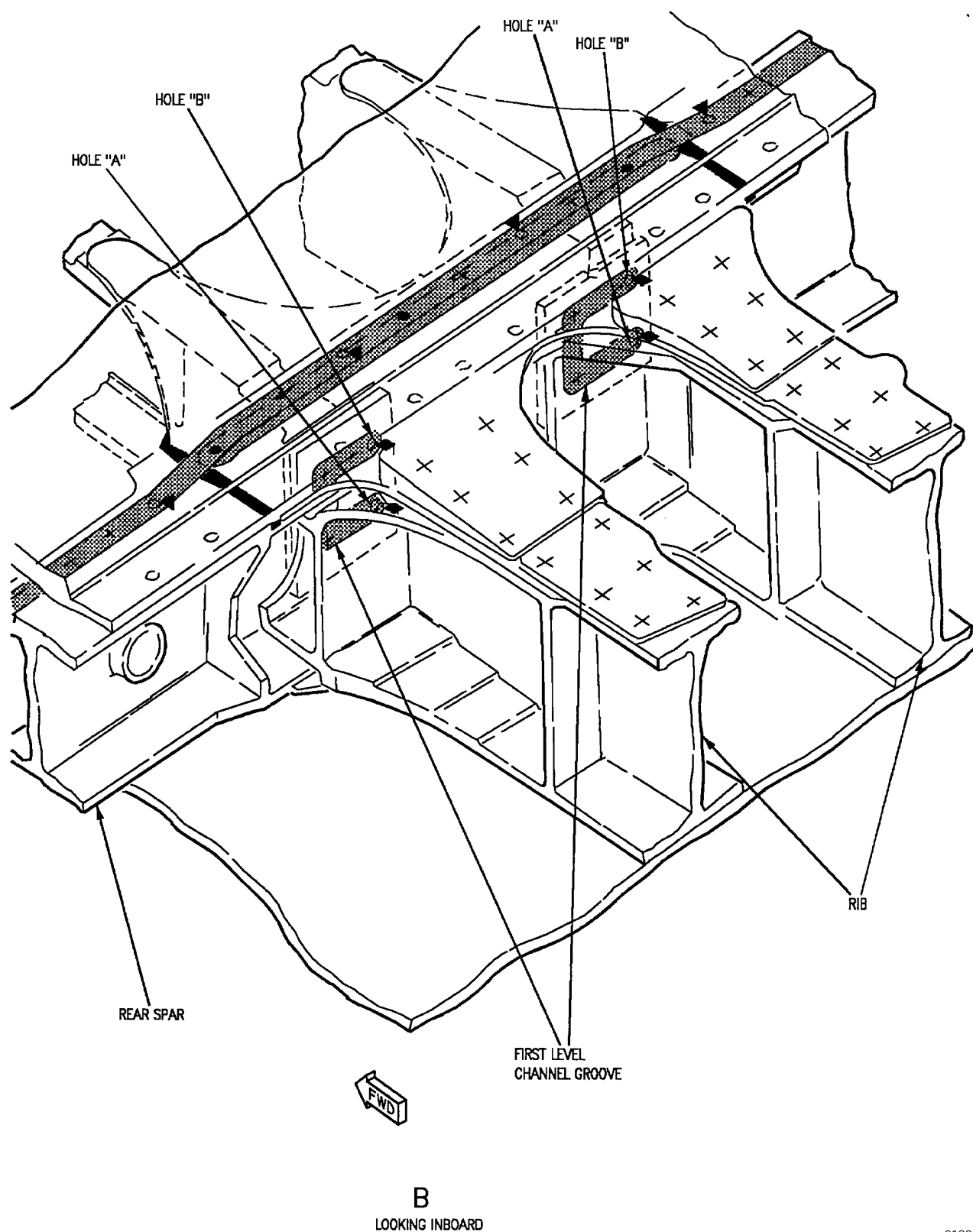


Figure 9. Rear Spar Channel Groove Seal Injection (Sheet 3)

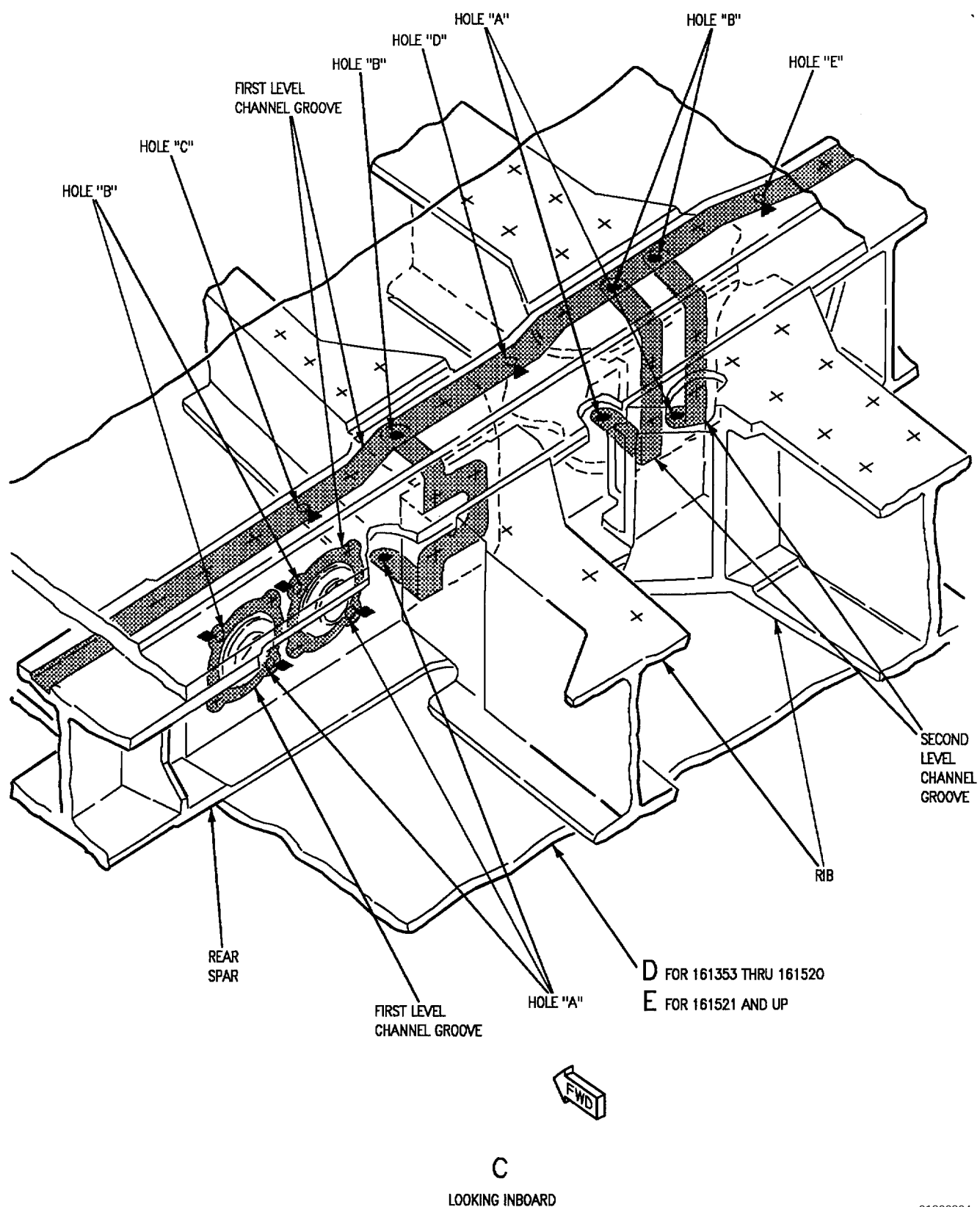


Figure 9. Rear Spar Channel Groove Seal Injection (Sheet 4)

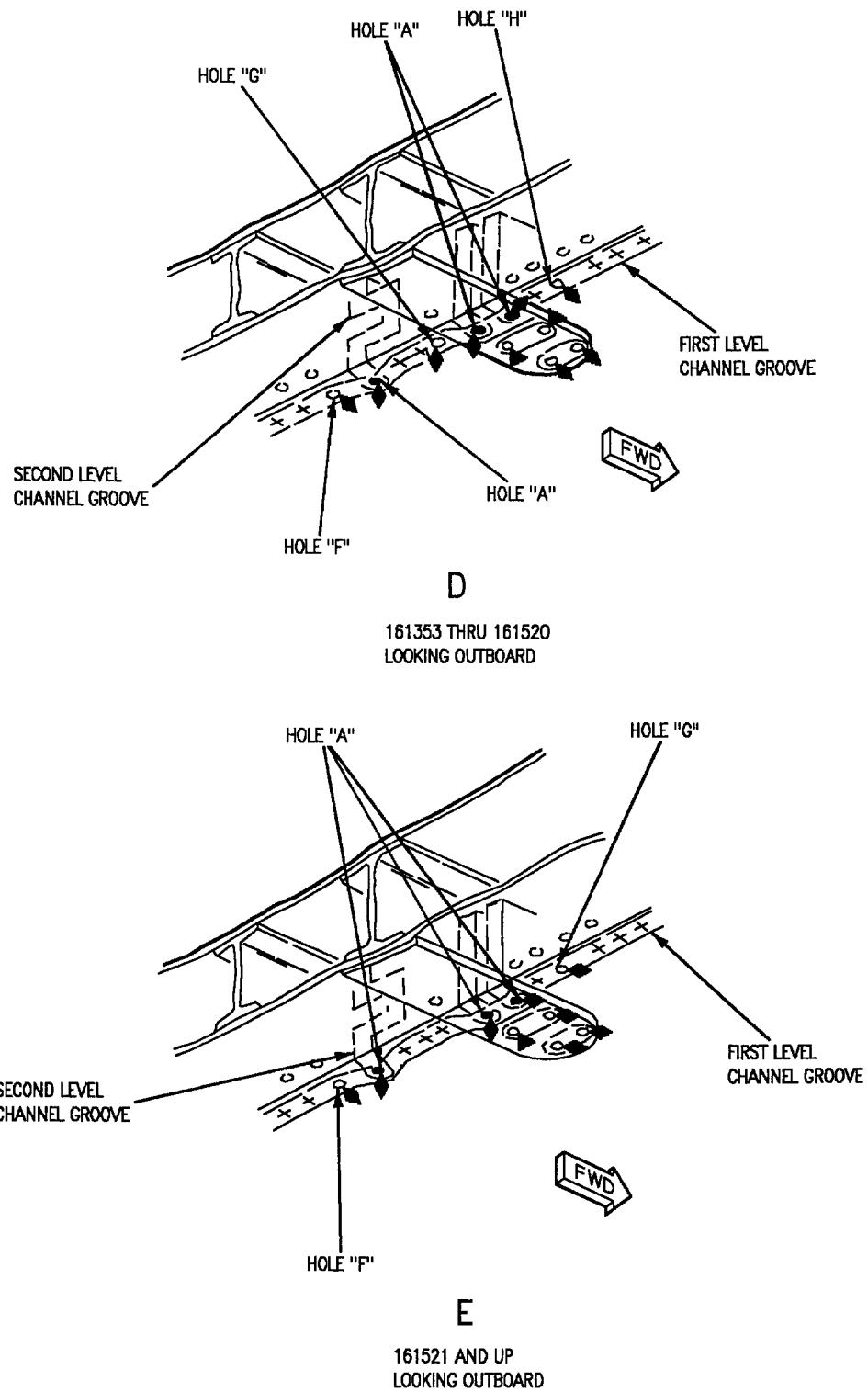


Figure 9. Rear Spar Channel Groove Seal Injection (Sheet 5)

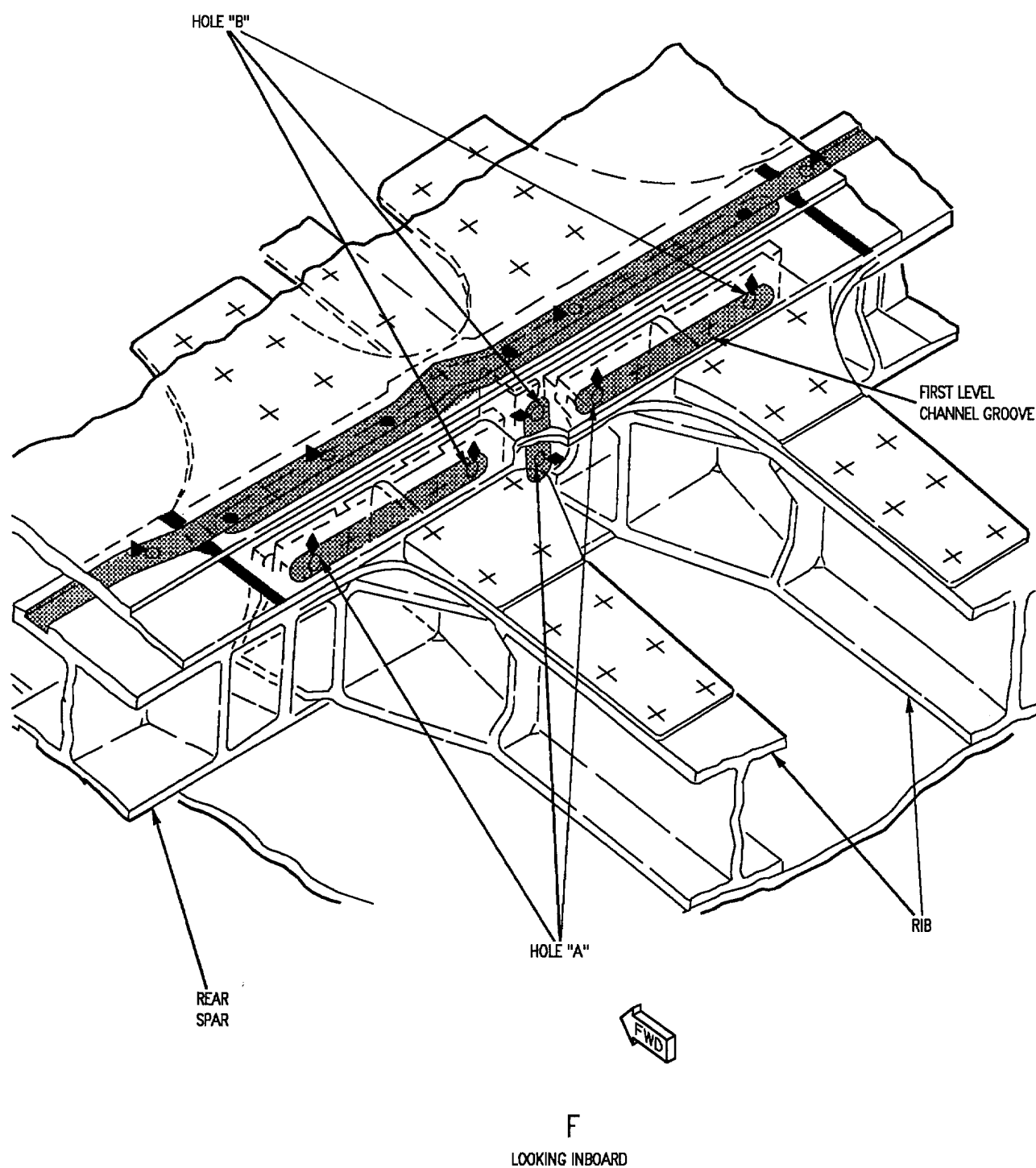


Figure 9. Rear Spar Channel Groove Seal Injection (Sheet 6)

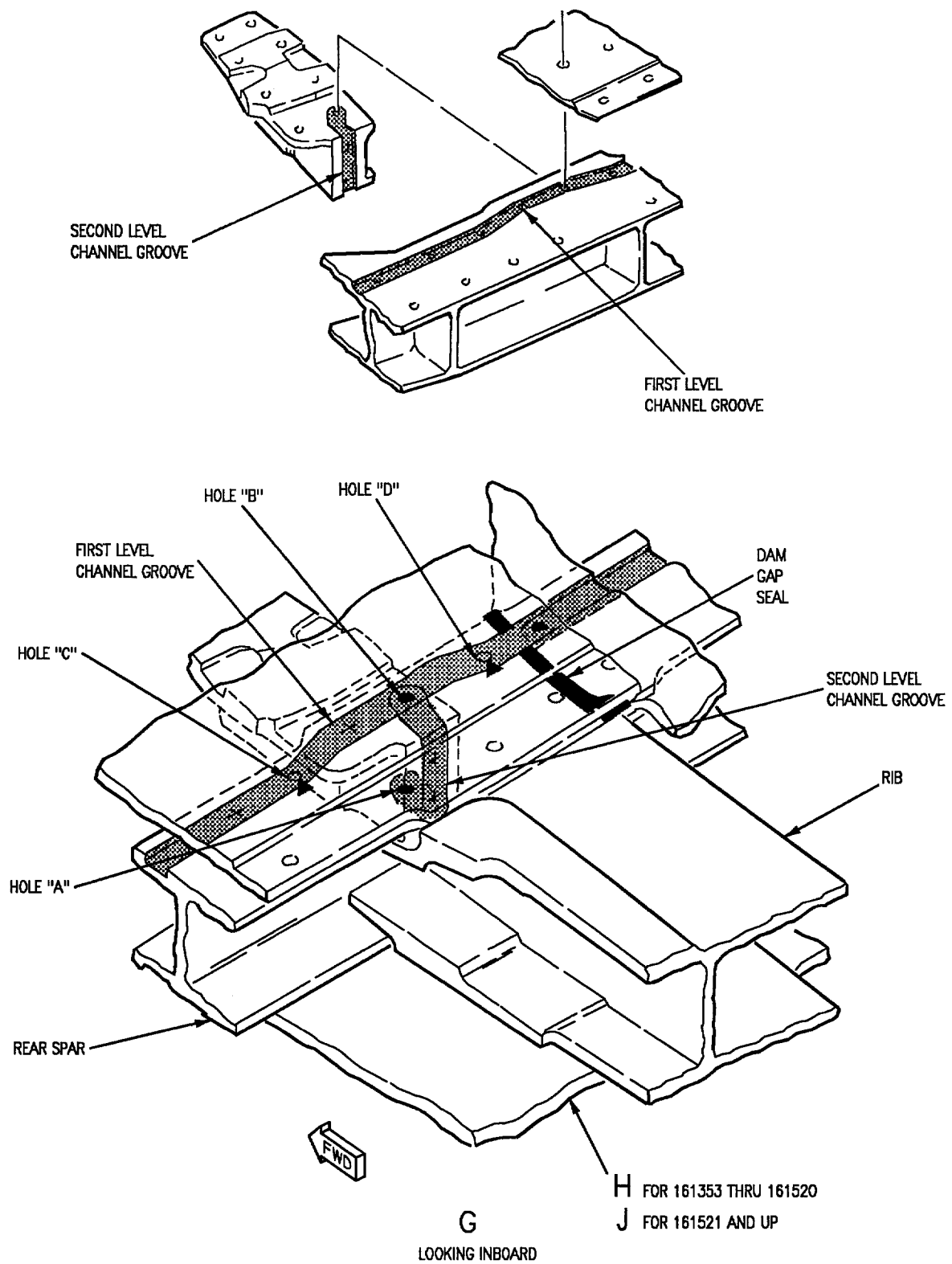


Figure 9. Rear Spar Channel Groove Seal Injection (Sheet 7)

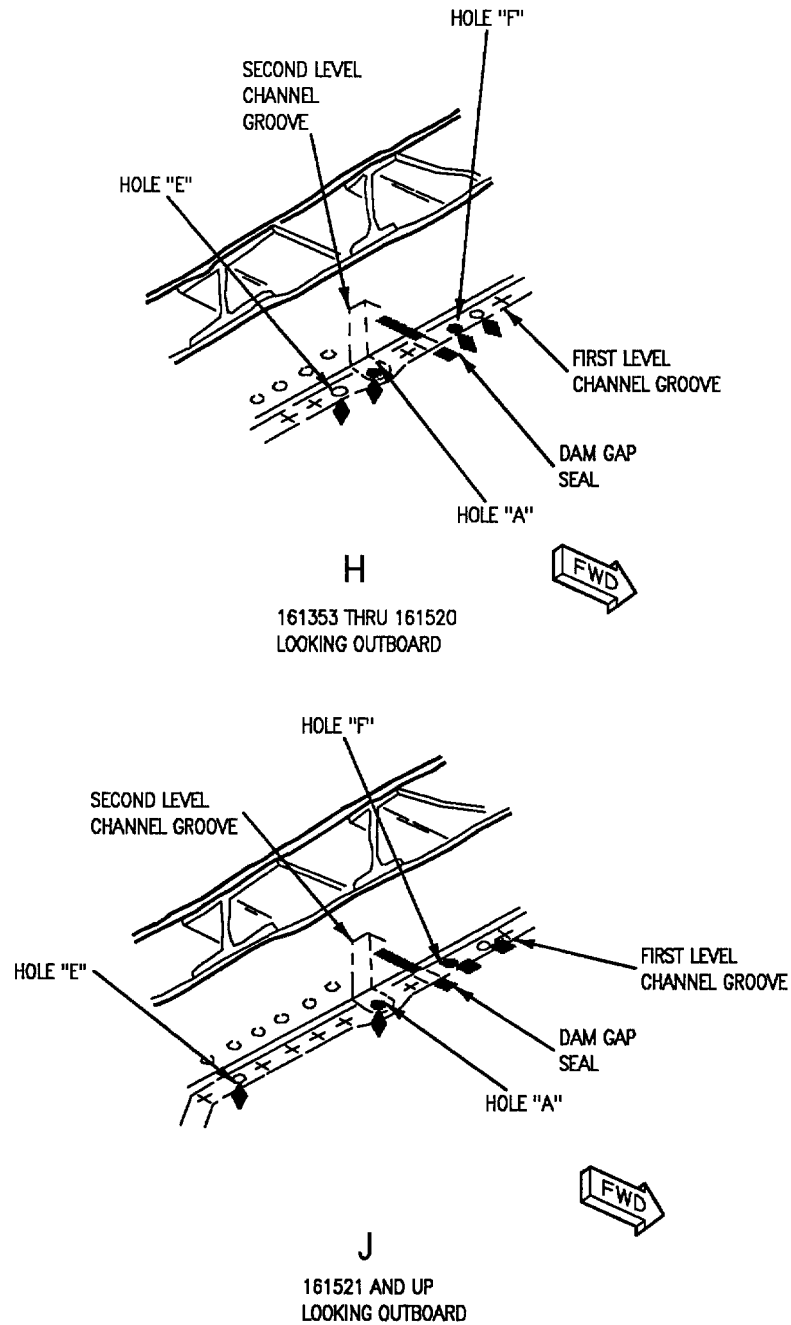


Figure 9. Rear Spar Channel Groove Seal Injection (Sheet 8)

36. **UPPER SKIN CHANNEL GROOVE SEAL INJECTION.** See figure 10.



Be sure correct observation bolt is removed when injecting across a recently repaired dam gap seal to avoid damage to dam gap seal.

37. **Straight Run Injection.** Injection fasteners at periphery of upper skin are injected in a straight run from one side of leak to the other side in direction of sealing compound flow.

a. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

b. Find injection point 2 injection fasteners from leak in opposite direction of sealing compound flow.

c. Inject channel groove sealing compound per Sealing Compound Injection, this WP.

38. **Upper Skin at Leading Edge Flap Trans-mission.** See views A and B.

a. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

b. Inject second level U-channels, if applicable, per Sealing Compound Injection, this WP, starting at hole "A" with hole "B" being observation hole.

c. Inject hole "B" blind for 5 seconds.

d. Inject second level dog bones, if applicable, per Sealing Compound Injection, this WP by removing either one of injection fasteners and injecting blind for 5 seconds.

e. Inject second level hog outs per Sealing Compound Injection, this WP, starting at hole "B" with hole "D" being observation hole.

f. Continue injection/observation cycle in direction of sealing compound flow with first level injection plug inboard of hog out injection fastener being observation hole.

g. After injection of all second level hog outs, inject first level channel groove starting at hole "H" with hole "A" being observation.

h. Continue first level injection/observation cycle across hog outs until hole "G."

i. Inject hole "G" blind for 5 seconds.

39. **Wing Fold Rib Tie-Link Spacers.** See sheet 3, figure 10.



Be careful when removing or reinstalling wing fold rib fasteners because damage to or loss of gang channel may occur.

When removing and reinstalling outboard fastener with a reduced flush head, be sure to use one size smaller tip than required for fastener with standard flush head because damage to fastener head or to skin may occur.

a. Inject second level tie-link spacers per Sealing Compound Injection, this WP by removing outboard injection fasteners and injecting blind for 5 seconds.

40. **Two Level Channel Groove Seal at Aft Splice Plates.** See views D and E.

a. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

b. Inject second level channel groove per Sealing Compound Injection, this WP, starting hole "A" with hole "B" being observation hole.

c. Continue injection/observation cycle to complete second level injection.

d. Inject first level channel groove starting at out-board injection fastener and continue injection/observation cycle until past second level channel groove.

e. Inject last observation hole blind for 5 seconds.

41. **Upper Skin Above Pylon Attach Points.** See Figure 10, sheets 1 and 2.



Inboard pylon and/or access door 20/21 must be removed to gain access to nuts to remove fasteners in holes "A," "B," and "C."

a. Prepare sealant injection gun per Preparation of Pneumatic Sealant Injection Gun, this WP.

b. Inject channel groove sealing compound per Sealing Compound Injection, this WP, starting at hole "A" with hole "B" being observation hole.

c. Leave first injection fastener out and continue with injection/observation cycle until hole "A" is last observation hole.

d. Inject hole "A" blind for 5 seconds.

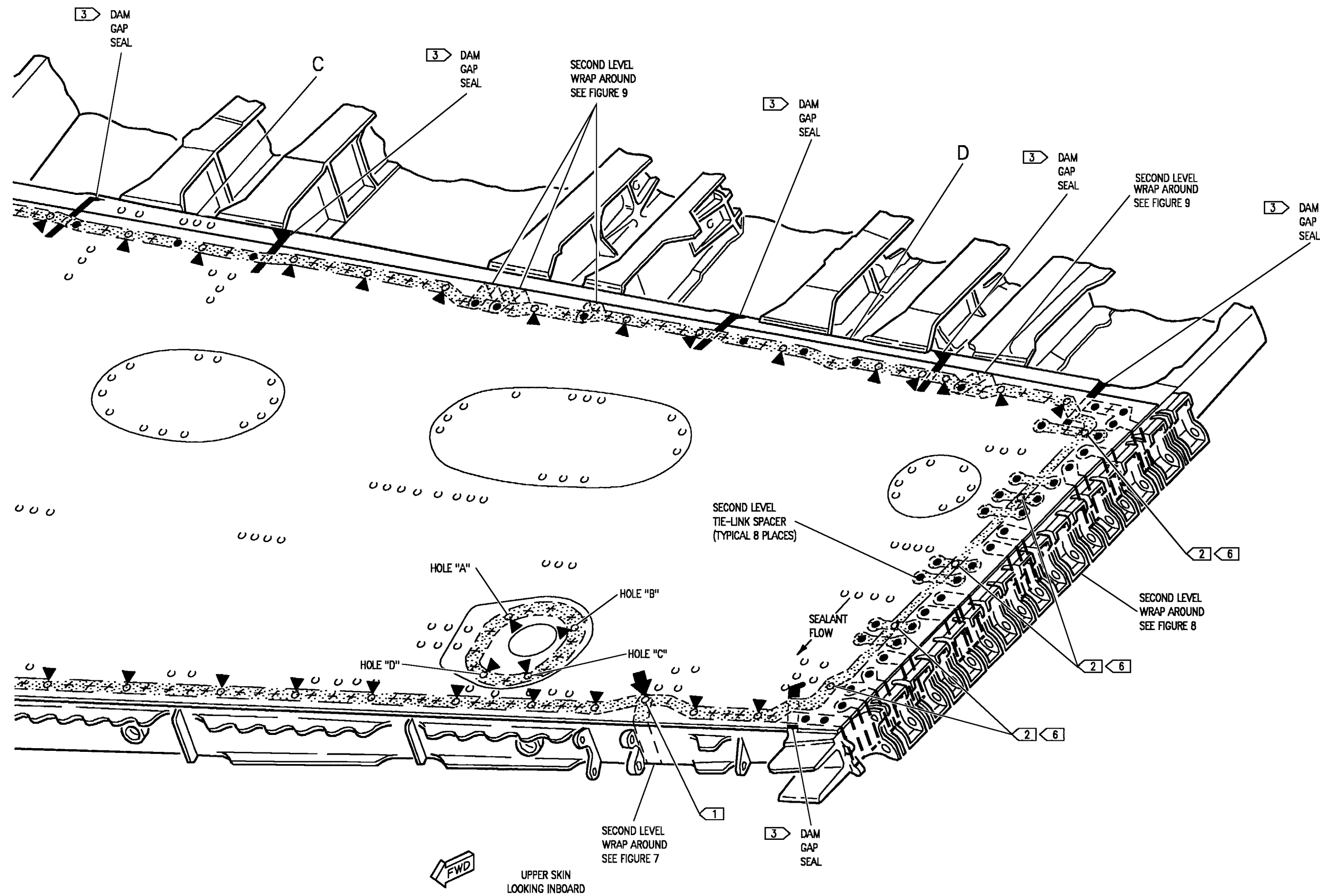


Figure 10. Upper Skin Channel Groove Seal Injection (Sheet 2)

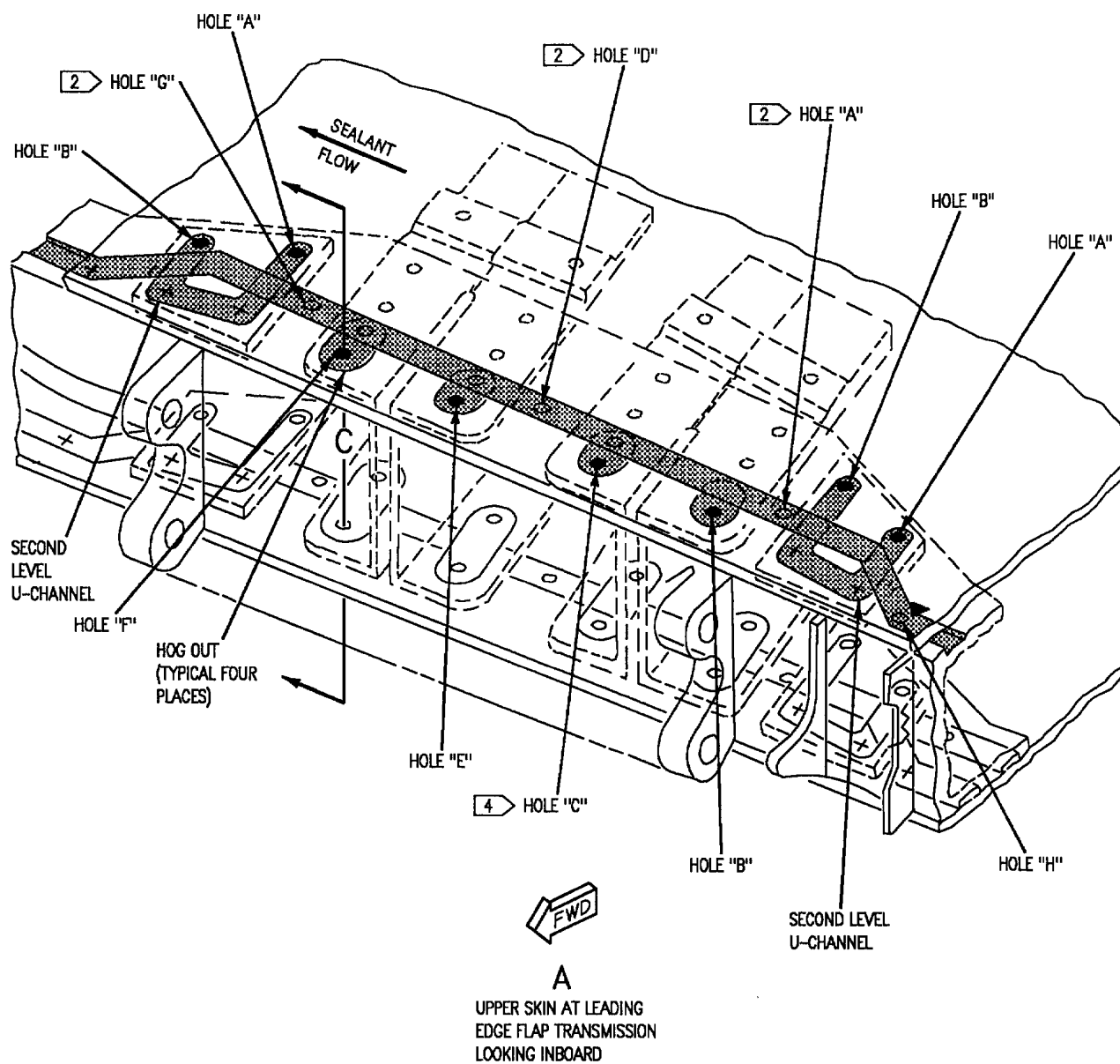


Figure 10. Upper Skin Channel Groove Seal Injection (Sheet 3)

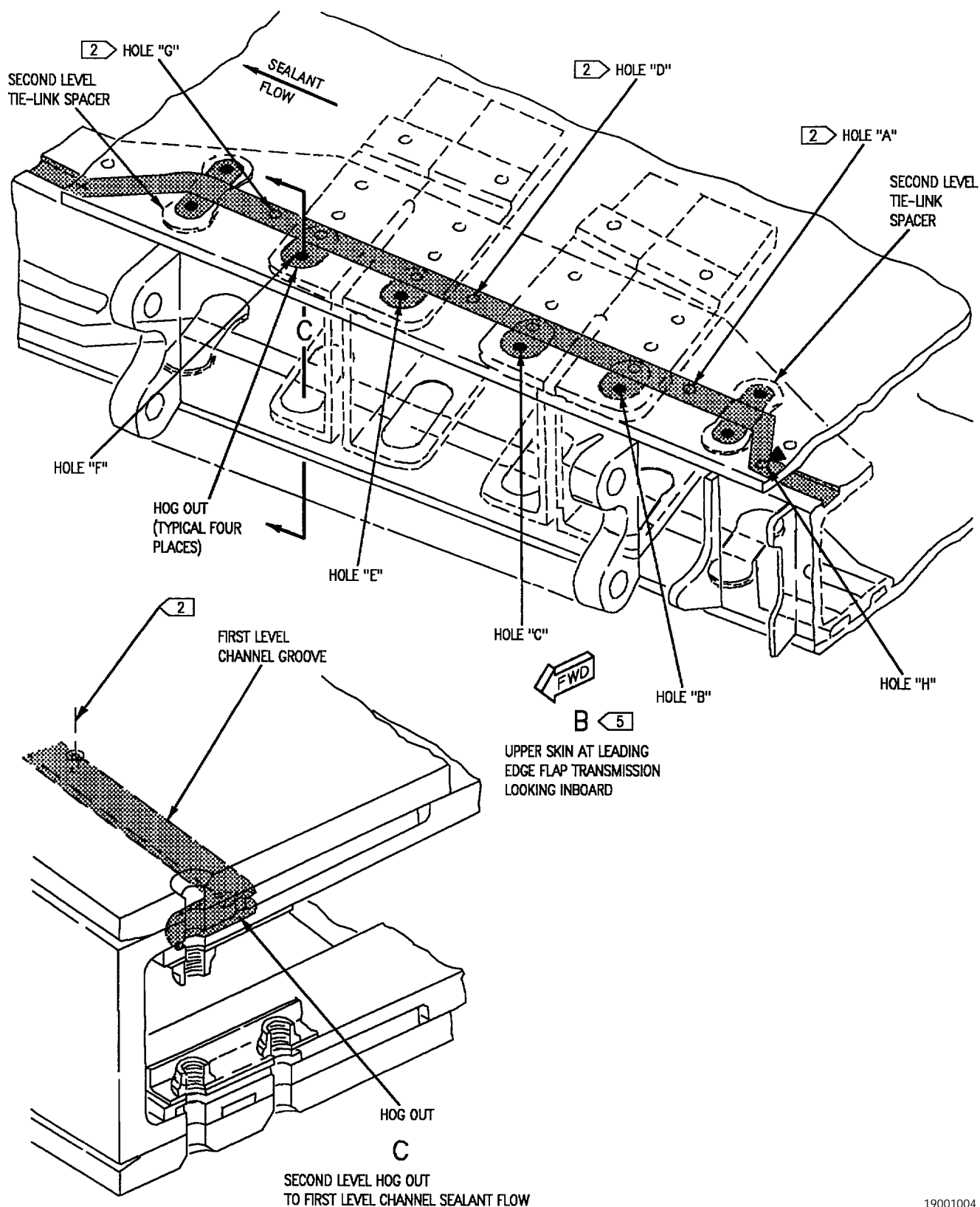


Figure 10. Upper Skin Channel Groove Seal Injection (Sheet 4)

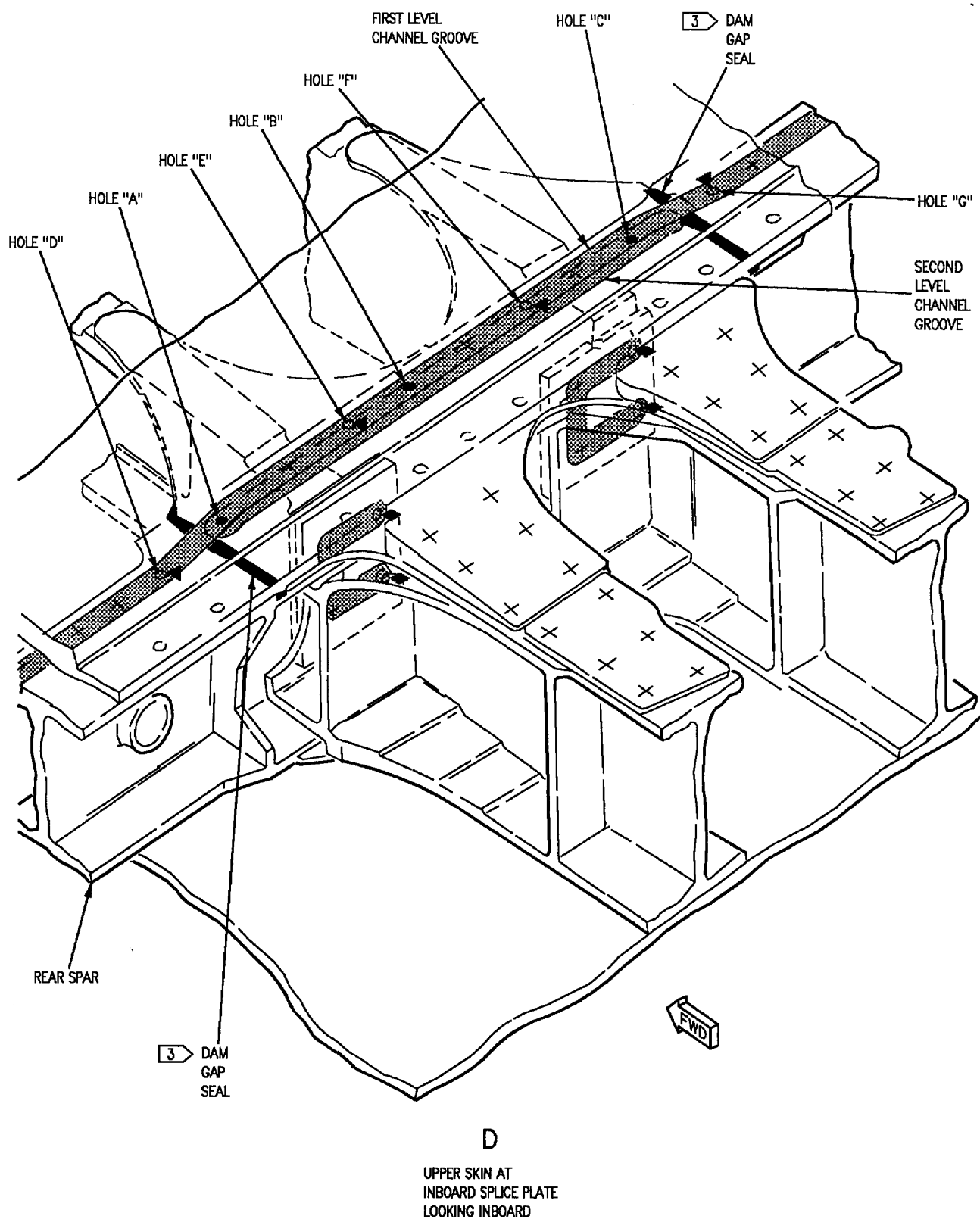


Figure 10. Upper Skin Channel Groove Seal Injection (Sheet 5)

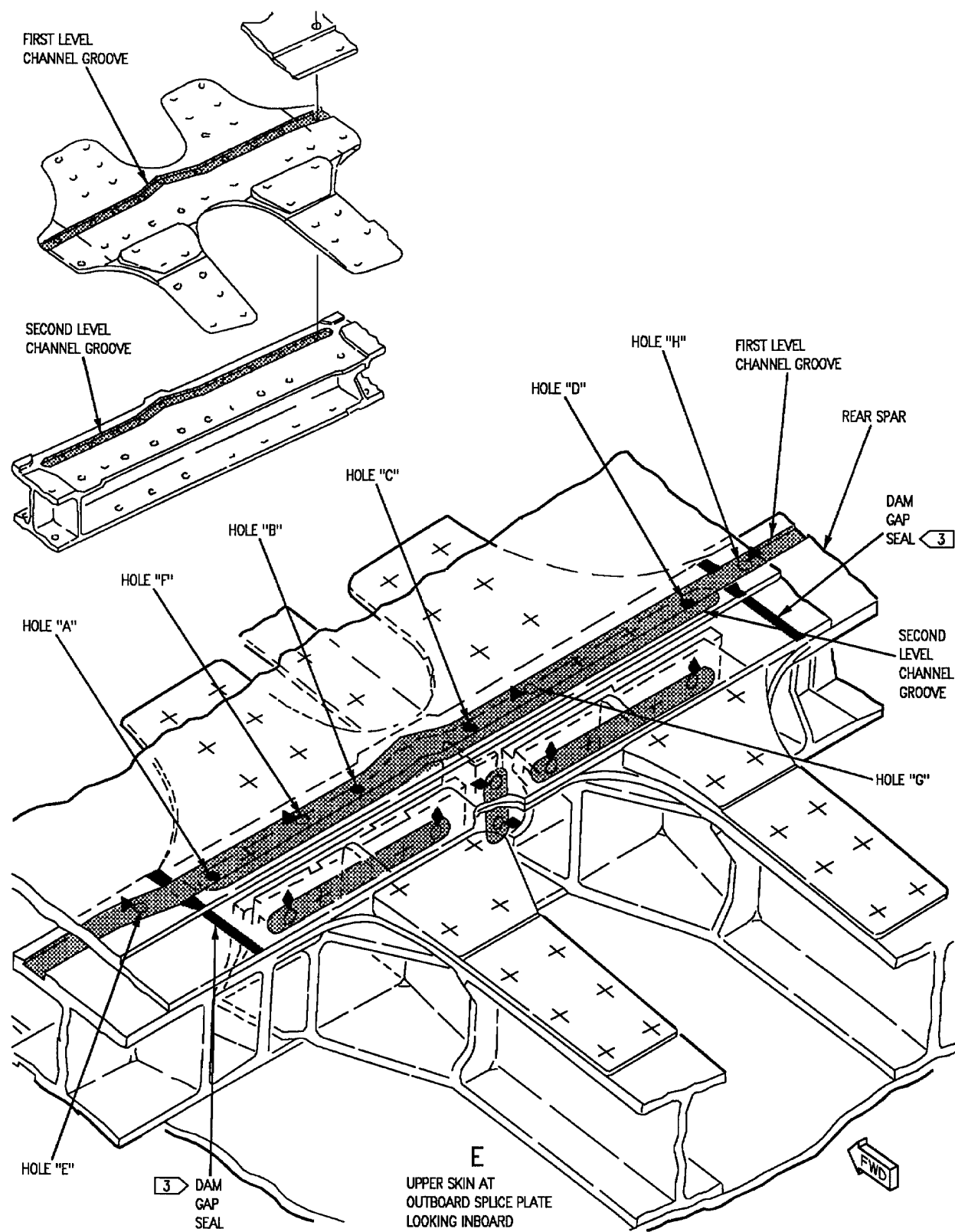


Figure 10. Upper Skin Channel Groove Seal Injection (Sheet 6)

19001006

LEGEND














-  REFERENCE FASTENER
-  REMOVABLE FASTENER SECOND LEVEL INJECTION POINT
-  REMOVABLE FASTENER FIRST LEVEL INJECTION POINT
-  PERMANENT FASTENER FIRST LEVEL INJECTION POINT
-  REMOVABLE FASTENER FIRST & SECOND LEVEL INJECTION POINT
-  DAM GAP SEAL
-  CAUTION SHOULD BE TAKEN WHEN REINSTALLING INJECTION HOLE FASTENER TO PREVENT MOVEMENT OR LOSS OF NUT ELEMENT
-  INJECTION PLUG FIRST LEVEL INJECTION POINT
-  WHEN INJECTING SEALANT IN DAM GAP AREA IT IS CRITICAL THAT CORRECT OBSERVATION HOLE IS USED
-  LEFT SIDE - 161978 THRU 161986, 162394 AND UP
RIGHT SIDE - 161978 AND UP
-  LEFT SIDE - 161353 THRU 161977, 161987
RIGHT SIDE - 161353 THRU 161977
-  FOR REPLACEMENT OF INJECTION PLUG REFER TO INJECTION PLUG REPLACEMENT (WP003 01)
-  GAIN ACCESS TO THE NUTS INSIDE THE PYLON SUPPORT FITTING

Figure 10. Upper Skin Channel Groove Seal Injection (Sheet 7)

42. **LOWER SKIN CHANNEL GROOVE SEAL INJECTION.** See figure 11.



Be sure correct observation bolt is removed when injecting across a recently repaired dam gap seal to avoid damage to dam gap seal.

43. **Straight Run Injection.** Injection fasteners at spar and rib attach points on lower skin are injected in a straight run from one side of a leak to the other side in direction of sealing compound flow.

- a. Prepare sealant injection gun per paragraph 9.
- b. Find injection point 2 injection fasteners from leak in opposite direction of sealing compound flow.
- c. Inject channel groove sealing compound per paragraph 17.

44. **Lower Skin at Leading Edge Flap Transmission.** See views A and B.

- a. Prepare sealant injection gun per paragraph 9.
- b. Inject second level U-channels, if applicable, per paragraph 17, starting at hole "A" with hole "B" being observation hole.
- c. Inject hole "B" blind for 5 seconds.
- d. Inject second level dog bones, if applicable, and the other second level channel grooves by removing either one of injection fasteners and injecting blind for 5 seconds.
- e. Inject first level channel groove across dog bones and other second level channel grooves per paragraph 43.

45. **Wing Fold Rib Tie-Link Spacers.** See sheets 3 and 6, figure 11.



Be careful when removing or reinstalling wing fold rib fasteners because damage to or loss of gang channel may occur.

When removing and reinstalling outboard fastener with a reduced flush head, be sure to use one size smaller tip than required for fastener with standard flush head because damage to fastener head or to skin may occur.

a. Inject second level tie-link spacers per paragraph 17 by removing outboard injection fasteners and injecting blind for 5 seconds.

46. **Lower Skin at Pylon Attach Covers.** See sheets 2 and 5, and views C and D.

- a. Prepare sealant injection gun per paragraph 9.
- b. Inject channel groove sealing compound per paragraph 17, starting at hole "A" with hole "B" being observation hole.
- c. Leave first injection fastener out and continue with injection/observation cycle until hole "A" is last observation hole.

d. Inject hole "A" blind for 5 seconds.

47. **Two Level Channel Groove at Aft Splice Plates.** See views E, F, G and H.

- a. Prepare sealant injection gun per paragraph 9.
- b. Inject second level channel groove per paragraph 17, starting at hole "A" with hole "B" being observation hole.
- c. Continue injection/observation cycle to complete second level injection.
- d. Inject first level channel groove starting at outboard injection fastener and continue injection/observation cycle until past second level channel groove.
- e. Inject last observation hole blind for 5 seconds.

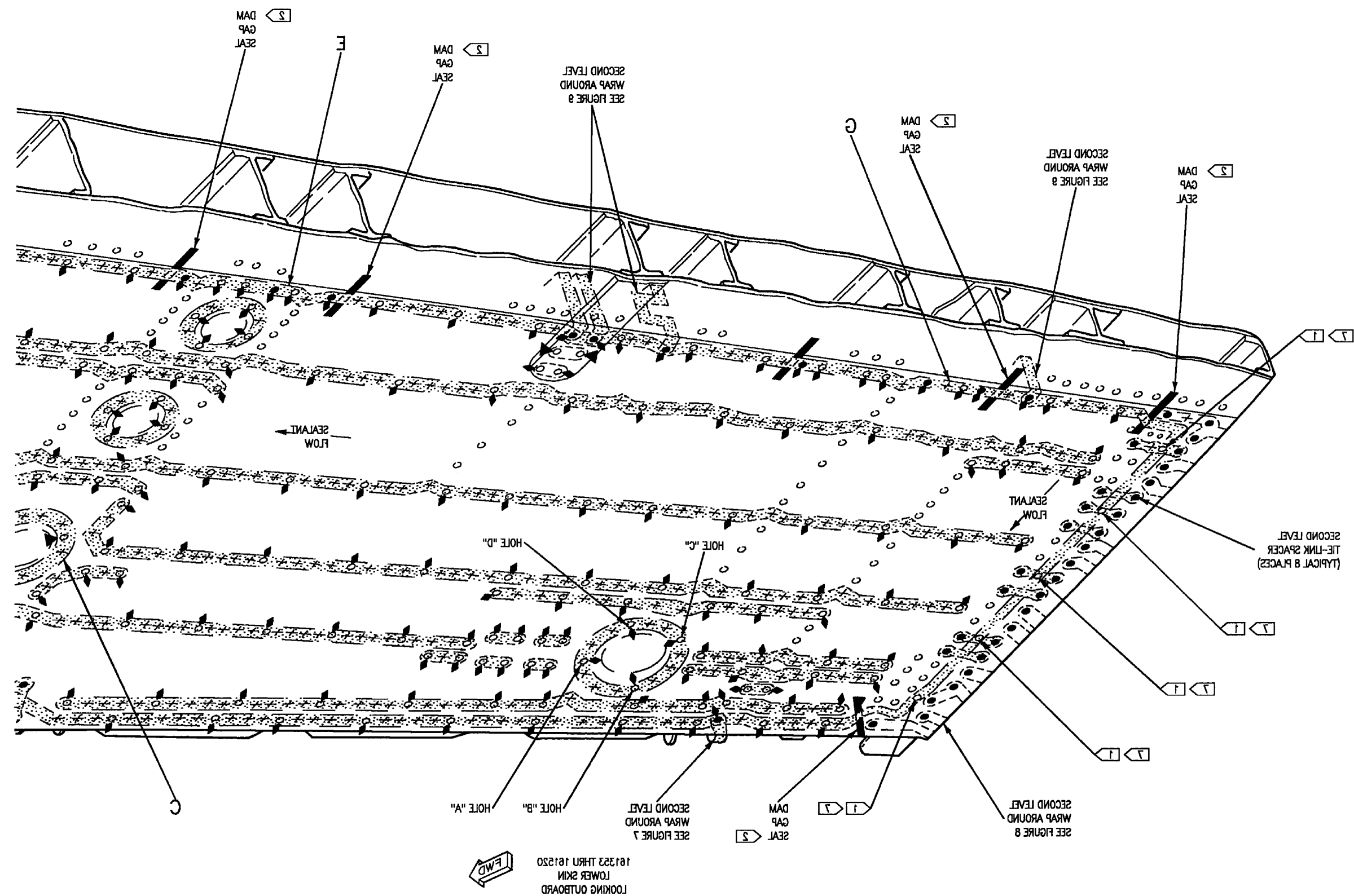


Figure 11. Lower Skin Channel Groove Seal Injection (Sheet 1)

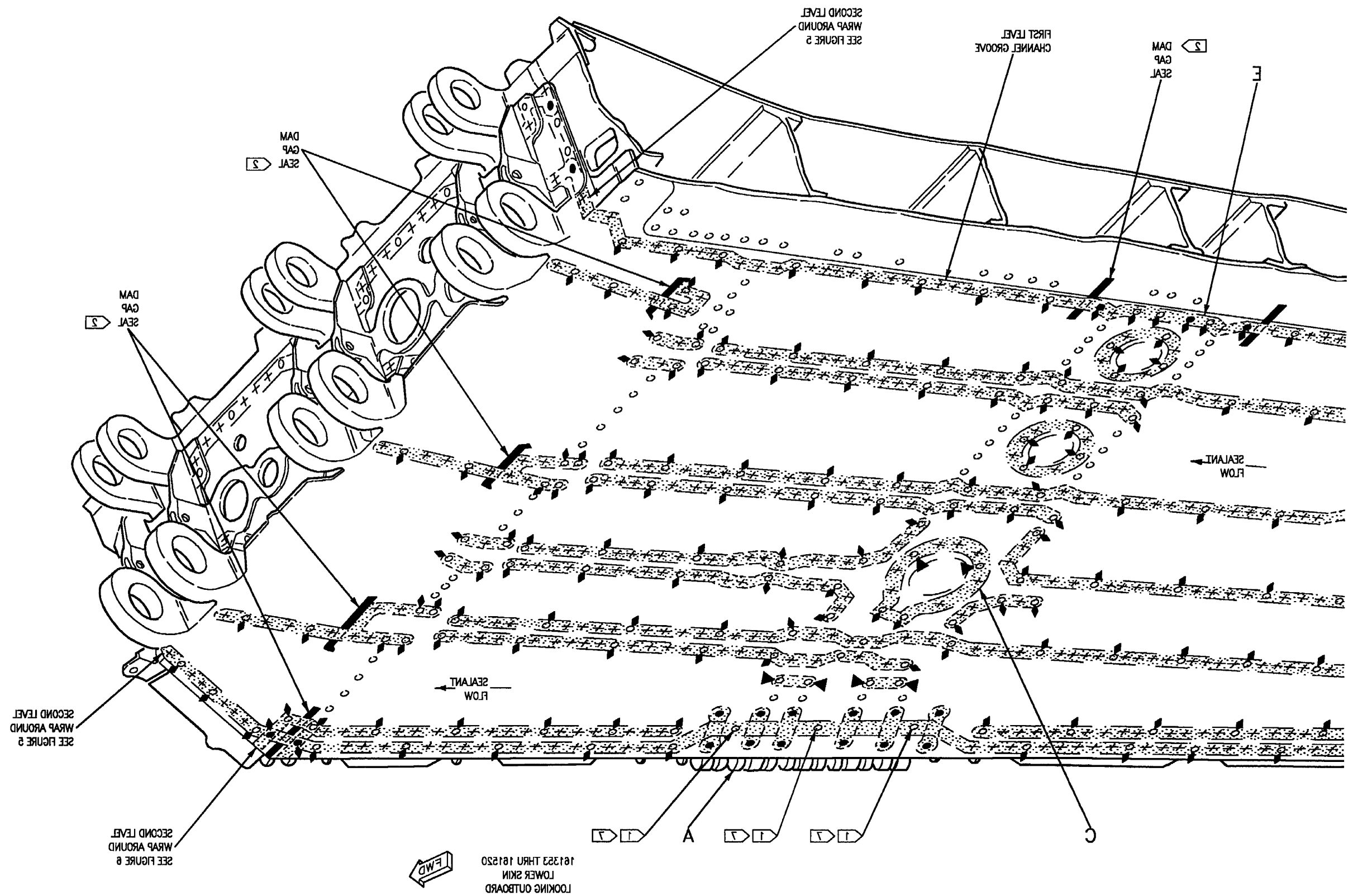


Figure 11. Lower Skin Channel Groove Seal Injection (Sheet 2)

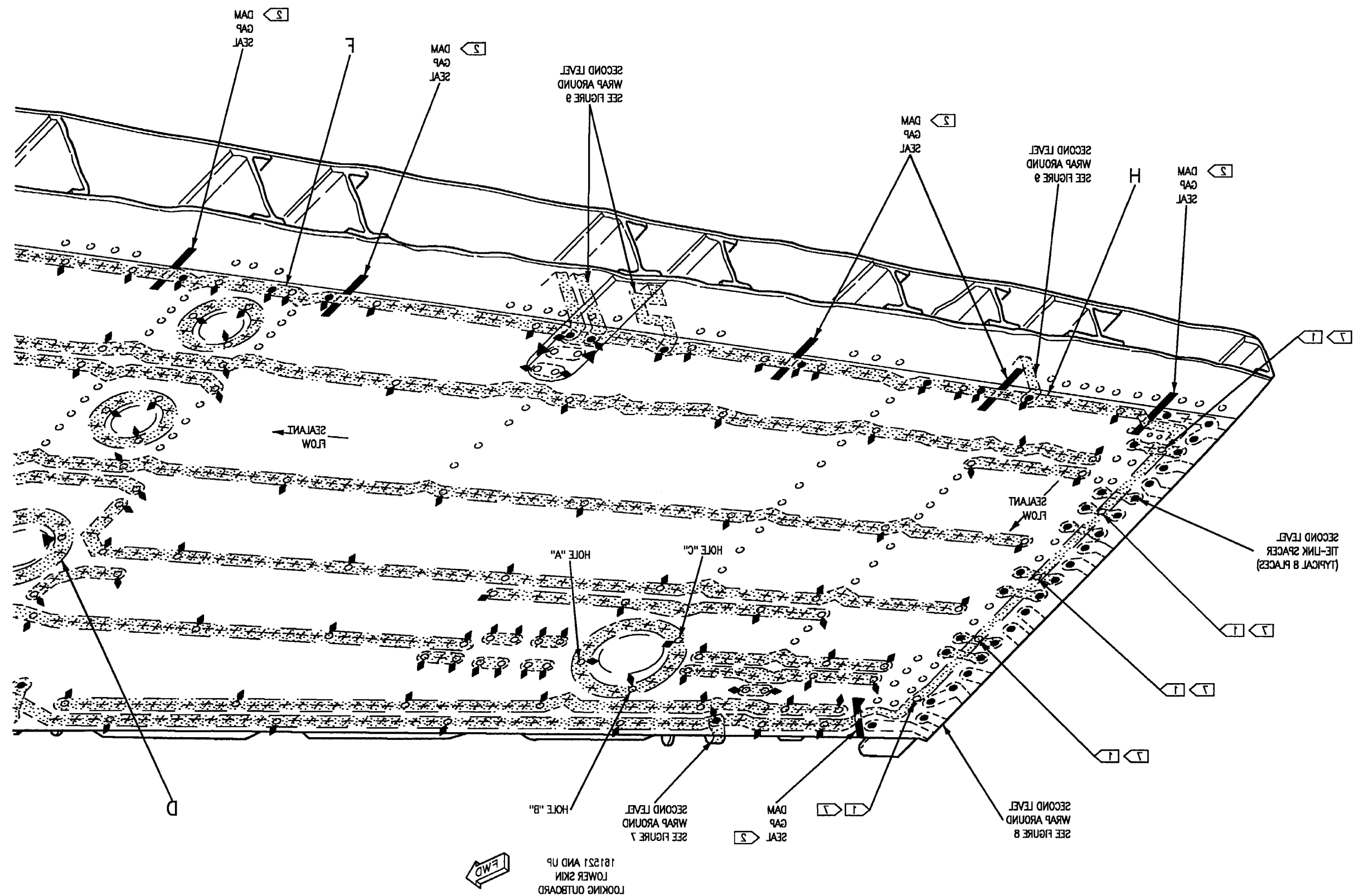


Figure 11. Lower Skin Channel Groove Seal Injection (Sheet 3)

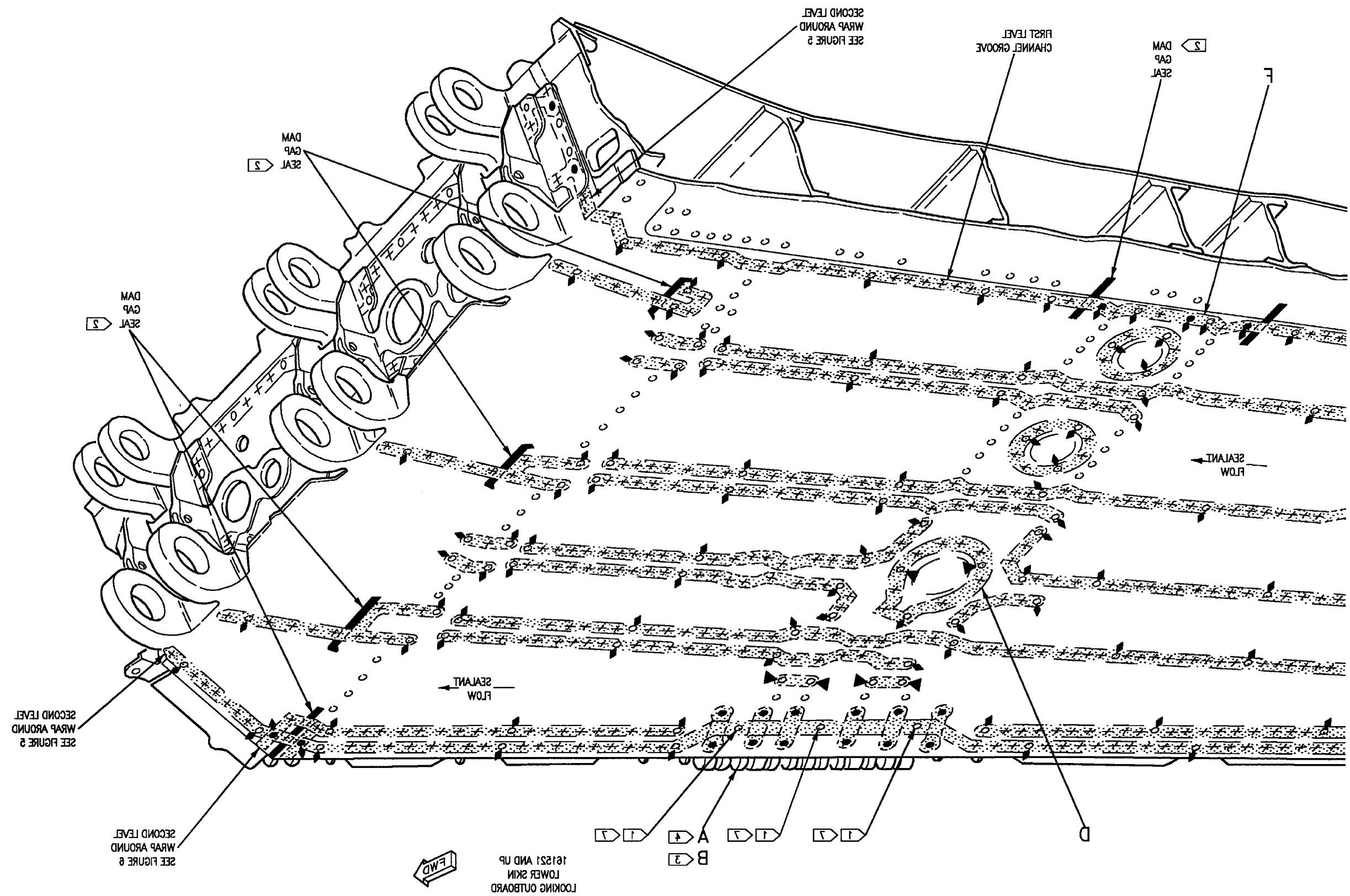
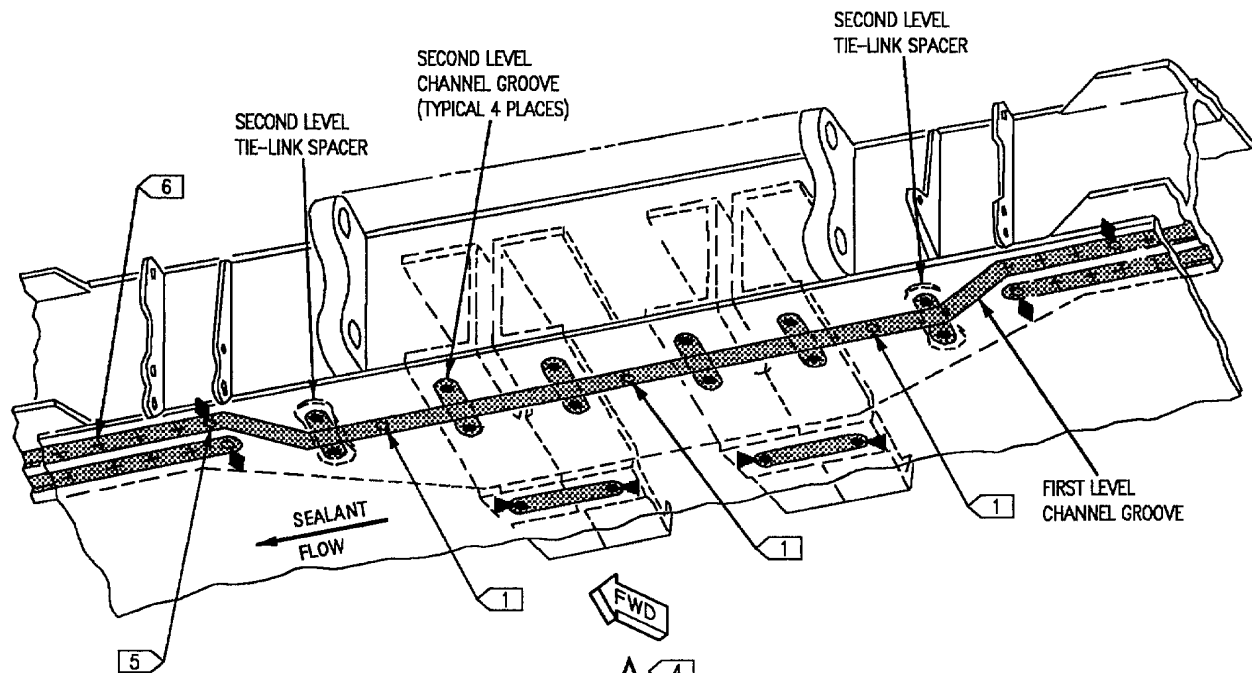
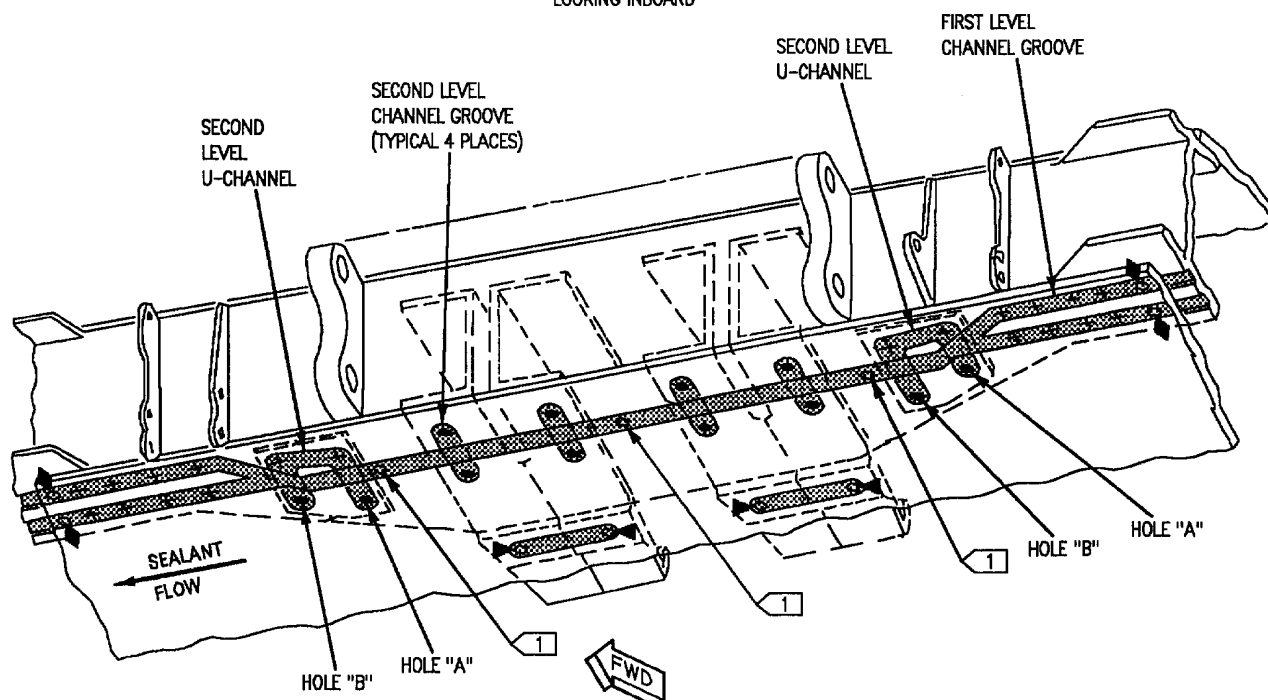


Figure 11. Lower Skin Channel Groove Seal Injection (Sheet 4)



A 4
LOWER SKIN AT
LEADING EDGE FLAP TRANSMISSION
LOOKING INBOARD



B 3
LOWER SKIN AT
LEADING EDGE FLAP TRANSMISSION
LOOKING INBOARD

Figure 11. Lower Skin Channel Groove Seal Injection (Sheet 5)

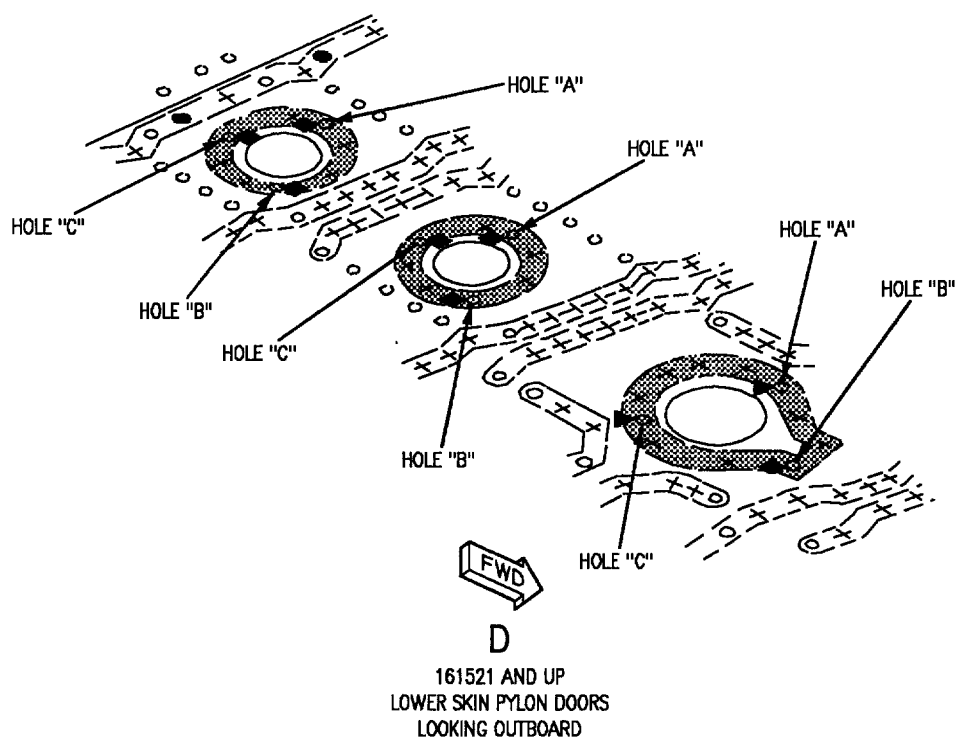
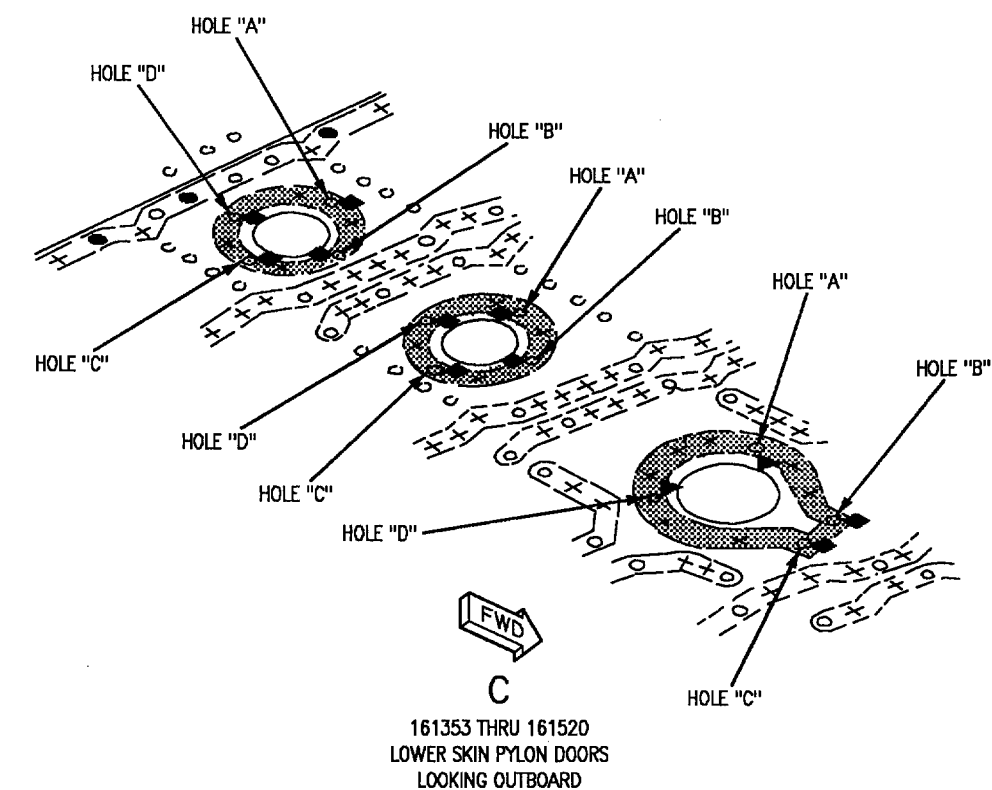
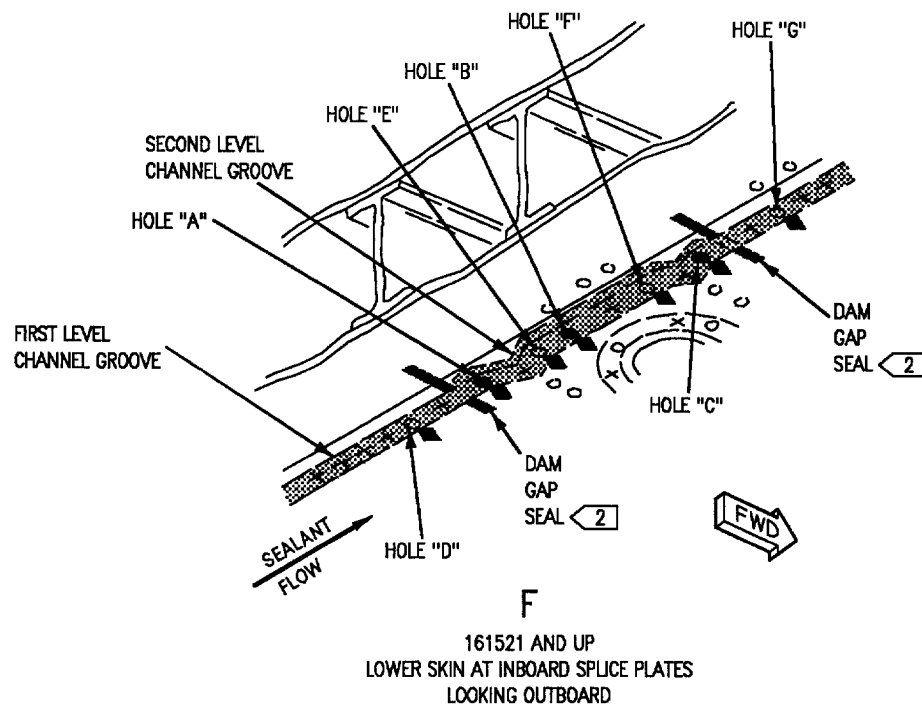
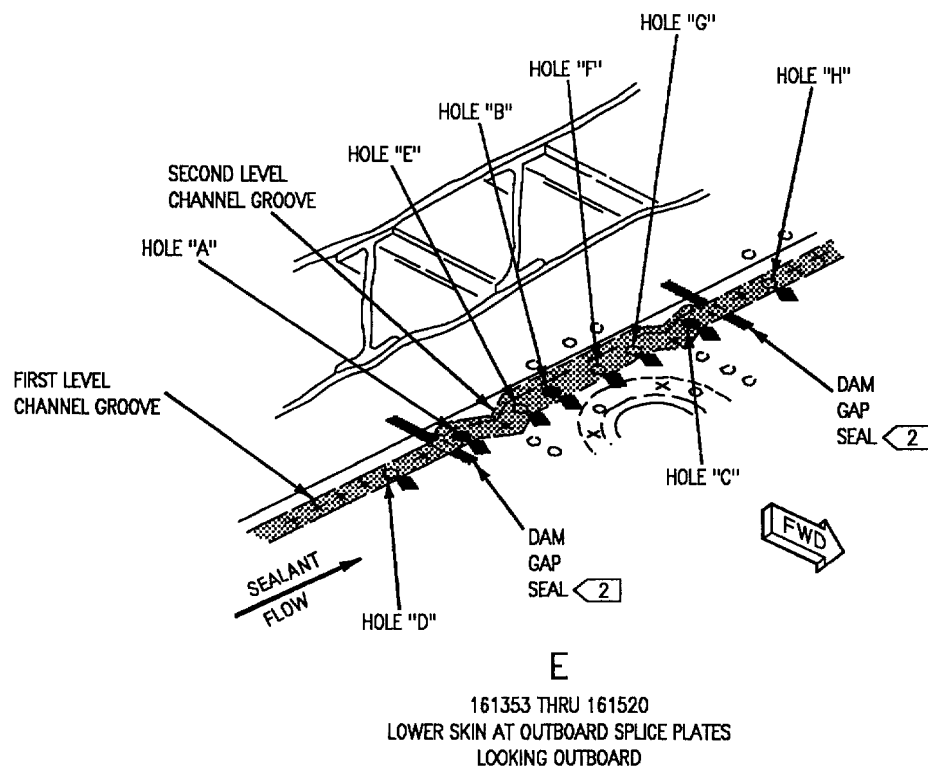
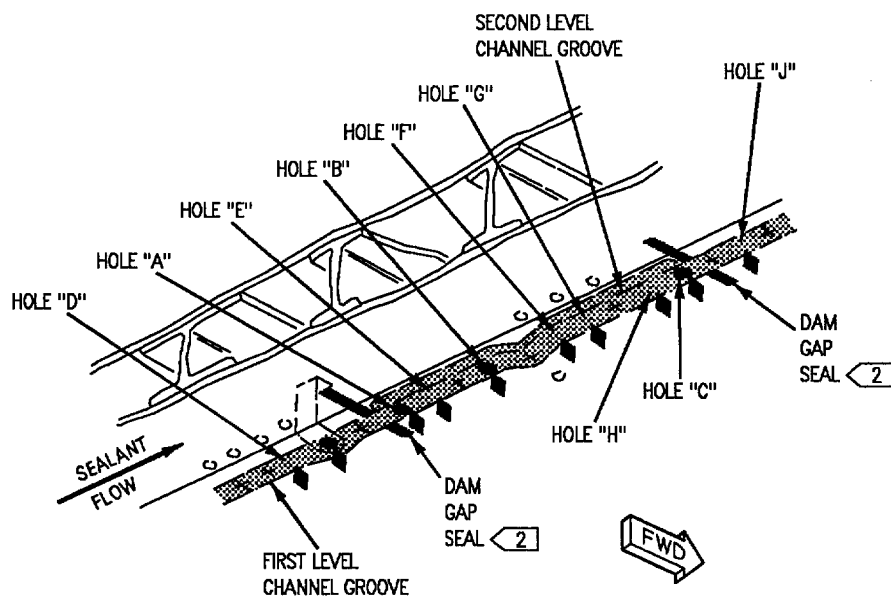


Figure 11. Lower Skin Channel Groove Seal Injection (Sheet 6)



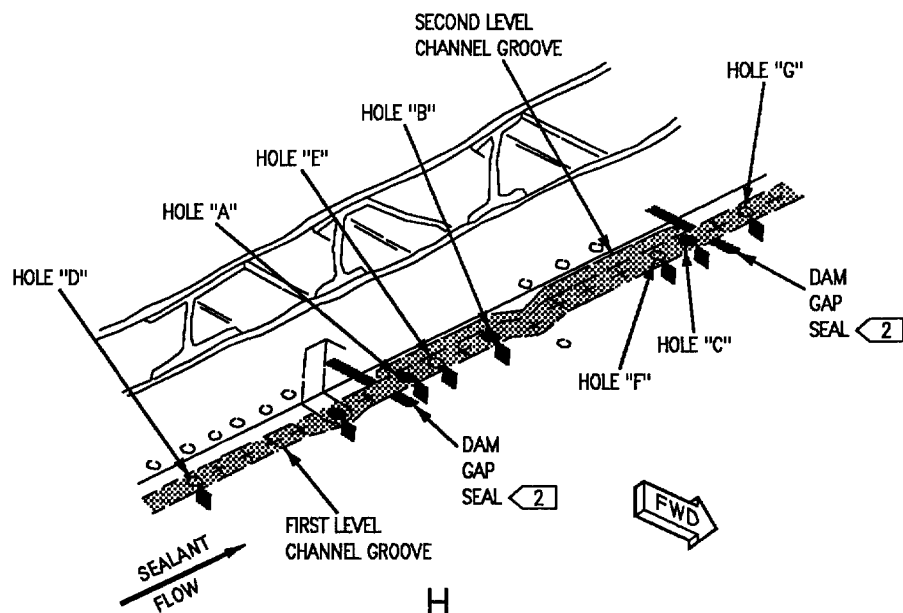
19001107

Figure 11. Lower Skin Channel Groove Seal Injection (Sheet 7)



G

161353 THRU 161520
LOWER SKIN AT OUTBOARD SPLICE PLATES
LOOKING OUTBOARD



H

161521 AND UP
LOWER SKIN AT INBOARD SPLICE PLATES
LOOKING INBOARD

19001108

Figure 11. Lower Skin Channel Groove Seal Injection (Sheet 8)

LEGEND

- + REFERENCE FASTENER
- REMOVABLE FASTENER SECOND LEVEL INJECTION POINT
- ▶○ REMOVABLE FASTENER FIRST LEVEL INJECTION POINT
- ◆● PERMANENT FASTENER SECOND LEVEL INJECTION POINT
- ◆○ PERMANENT FASTENER FIRST LEVEL INJECTION POINT
- ▶●○ REMOVABLE FASTENER FIRST & SECOND LEVEL INJECTION POINT
- DAM GAP SEAL
- 1> INJECTION PLUG FIRST LEVEL INJECTION POINT
- 2> WHEN INJECTING SEALANT IN DAM GAP AREA IT IS CRITICAL THAT CORRECT OBSERVATION HOLE IS USED
- 3> LEFT SIDE - 161978 THRU 161986, 162394 AND UP
RIGHT SIDE - 161978 AND UP
- 4> LEFT SIDE - 161353 THRU 161977, 161987
RIGHT SIDE - 161353 THRU 161977
- 5> LEFT SIDE - 161353 THRU 161714 ◆○ 161715
AND UP +
RIGHT SIDE - 161353 THRU 161713 ◆○ 161714
AND UP +
- 6> LEFT SIDE - 161353 THRU 161714 + 161715
AND UP ◆○
RIGHT SIDE - 161353 THRU 161713 + 161714
AND UP ◆○
- 7> FOR REPLACEMENT OF INJECTION PLUG REFER TO
INJECTION PLUG REPLACEMENT (WP003 02)

Figure 11. Lower Skin Channel Groove Seal Injection (Sheet 9)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

OUTER WING REMOVAL AND INSTALLATION

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Outer Wing Removal with Damaged Wing Fold Transmission	WP020 03
Integrated Flight Controls	A1-F18AC-570-300
Aileron (84MPU525 or 84MPV526) or Aileron Shroud (84MPU527 or 84MPV528)	WP010 00
Inboard Leading Edge Flap Transmission (84MAU505 or 84MAV501)	WP030 00
Wing Fold Swivel Joint (17U-U503 or 17U-V504)	WP059 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Line Maintenance Procedures	A1-F18AC-LMM-000
Plane Captain Manual	A1-F18AC-PCM-000
Structure, Illustrated Parts Breakdown	A1-F18AC-SRM-410
Wing, Aircraft Assembly of	FIG004 00
Weapon Control Systems	A1-F18C-740-300
Guided Missile Launcher LAU-7/A-4	WP024 00

Alphabetical Index

Subject	Page No.
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Removal (With Undamaged Wing Fold Transmission)	2

Record of Applicable Technical Directives

None

Support Equipment Required

Nomenclature	Part Number or Type Designation
Adapter Set, Pin Removal/Insertion	74D110043
External Electrical Power Source	-
External Hydraulic Power Source (2)	-
Flap Control Surface Lock	74D750005
Outer Wing Sling	74D110030

Support Equipment Required
(Continued)

Nomenclature	Part Number or Type Designation
Pin Set, Outer Wing/ Leading Edge Flaps Installation/Removal	74D110060
Torque Wrench, 0 to 50 Inch-Pounds	-
Torque Wrench, 0 to 150 Inch-Pounds	-
Torque Wrench, 0 to 600 Inch-Pounds	-

Materials Required**Specification
or Part Number****Nomenclature**

Cleaning Compound	PR146 Blue
Cotter Pin	MS24665-151
Cotter Pin	MS24665-302
Cotter Pin	MS24665-86
Grease, Aircraft	MIL-G-81322
Isopropyl Alcohol	TT-I-735, Grade 1
Oil, Lubricating	VV-L-800
Petrolatum, Technical	VV-P-236
Rymple Cloth	AMS-3819
Sealing Compound	MIL-S-81733, Type 1/2
Tape, Pressure Sensitive	855-1.000

**1. REMOVAL (WITH UNDAMAGED WING
FOLD TRANSMISSION).**

2. These procedures are for the left outer wing. Procedures for right outer wing are identical except as indicated. For removal of outer wing with damaged wing fold transmission (WP020 03).

a. Make sure safety devices required for ground operation are installed (A1-F18AC-PCM-000).

b. Lower outboard leading edge flap per substeps below:

(1) On LH vertical control panel, set FLAP switch to AUTO.

(2) On No. 5 circuit breaker panel assembly open the circuit breakers below:

(a) 12CBD071 RMG RLY CONT.

(b) On 161353 THRU 161360, 12CBD028 LDG GR CONT UNIT.

(c) On 161361 THRU 161519, 12CBD028 NG RLY CONT.

(d) 12CBD070 LMG RLY CONT.



Apply 2850 psi minimum pressure to aircraft to prevent damage to hydraulic drive unit.

(3) Apply external hydraulic power to hydraulic systems 1 and 2 (A1-F18AC-LMM-000).

(4) Apply external electrical power (A1-F18AC-LMM-000).

(5) Set 4 switch to B ON.

(6) Set RESET switch.

(7) On MAP GAIN control panel assembly, set SPIN switch to RCVY.

(8) Turn off hydraulic power (A1-F18AC-LMM-000).

(9) Turn off electrical power (A1-F18AC-LMM-000).

(10) On No. 5 circuit breaker panel assembly close the circuit breakers below:

(a) 12CBD071 RMG RLY CONT.

(b) On 161353 THRU 161360, 12CBD028 LDG GR CONT UNIT.

(c) On 161361 AND UP, 12CBD028 NG RLY CONT.

(d) 12CBD070 LMG RLY CONT.

c. Remove door 190L (or 190R) (A1-F18AC-LMM-010).

d. Remove guided missile launcher LAU-7/A-4 (A1-F18AC-740-300, WP024 00).

e. Apply external electrical power (A1-F18AC-LMM-000).

f. Apply external hydraulic power to systems 1 and 2 (A1-F18AC-LMM-000).



Make sure wire bundle to guided missile launcher, LAU-7/A-4 is clear of outboard flap as damage to wire bundle could result.

g. Raise outboard leading edge flap and trailing edge flap, do substeps below:

(1) Set 4 switch to B ON.

(2) Set RESET switch.

(3) Set SPIN switch to NORM.

h. Remove hydraulic and electrical power from aircraft (A1-F18AC-LMM-000).

i. Install flap control surface aircraft ground safety lock (A1-F18AC-PCM-000).

j. Remove doors 91L (or 91R), 93L (or 93R), 95L (or 95R), 142L (or 142R), 152L (or 152R), 153L (or 153R), 154L (or 154R), 156L (or 156R), 181L (or 181R), 182L (or 182R), 183L (or 183R), 185L (or 185R), 187L (or 187R), 188L (or 188R), and 189L (or 189R) (A1-F18AC-LMM-010).

k. If existing outer wing is to be reinstalled, go to step aa. If outer wing is to be replaced, continue with the next step.

l. Remove bolt (25, figure 1) and washer, securing support (26) to outer wing.

m. Remove bolt (24) and washer, securing support (23) to outer wing.

n. Remove bolt (14) and attaching hardware, from shaft (13). Remove shaft (13) from leading edge flap transmission (flap transmission).

o. Disconnect connectors (10 and 11) from asymmetry control.

p. Remove bolt (7) and attaching hardware, at flap transmission outboard stabilizing attach point.

q. Remove bolt (12) and attaching hardware, at flap transmission inboard stabilizing attach point.

r. Remove bolt (22) and attaching hardware, securing lead (21) to outboard flap (18) or outer wing (2, figure 3).

s. Remove bolt (17, figure 1) and attaching hardware, securing outboard flap (18) to inboard flap hinge (16).

t. Remove bolt (20) and attaching hardware, securing outboard flap (18) to outboard flap hinge (18).

u. Loosen nuts (6) on outboard end of upper and lower expandable bolts (4).

v. Remove nuts (15) and attaching hardware from inboard end of upper and lower expandable bolts (4).

w. Install protector (3) on outboard end of lower expandable bolt (4) and while supporting and shaking outboard leading edge flap and flap transmission, remove lower expandable bolt (4) in an outboard direction. While removing lower expandable bolt (4), install pin (1).

x. Install pin (2) when lower expandable bolt (4) is removed.

y. Install protector (3) on outboard end of upper expandable bolt (4) and while supporting and shaking outboard leading edge flap and flap transmission, remove upper expandable bolt (4) in an outboard direction.

z. Supporting outboard flap, remove pins (1 and 2) and remove outboard flap and flap transmission from aircraft as one assembly.

aa. Remove door 83L (or 83R) (A1-F18AC-LMM-010).

ab. Remove aileron shroud (A1-F18AC-570-300, WP010 00).

ac. Remove wing fold swivel and sheer pin (A1-F18AC-570-300, WP059 00).

ad. Disconnect connectors (6, 10, 12, and 14, figure 2) and ground (4).

ae. Remove clamps (5, 9, 11, 13, and 15) and attaching hardware.

af. Remove clamps (1 and 2) and attaching hardware.

ag. Pull wire bundle from door 83L (or 83R) area through hole in structure. Leave wire bundle with inner wing.

ah. Remove support (11, figure 3) and attaching hardware, from outer wing.

ai. Remove bolt (10) and attaching hardware, from wing fold coupling drive support (support).

aj. Manually raise aileron and engage pin (16, figure 2).

ak. In cockpit, pull wing fold control handle out.

al. Make sure wing fold aircraft ground safety pin is installed (A1-F18AC-PCM-000).

am. Secure aft attach point for flipper door up and tape to inner wing.

an. Remove cotter pin (4, figure 3), nuts (5) and washers (6) from forward and aft ends of inboard (or upper) and outboard (or lower) pins (7).

ao. Position hoist and attach sling (1) to outer wing.



Make sure support clears outer wing during operation, or damage could result in the outer wing.

ap. Take up slack on hoist while manually operating outer wing to the folded position.

aq. Remove bolt (14) and attaching hardware from wing fold flipper door arm (arm).

ar. Attach wing fold pin removal slide hammer assembly (3) to outboard pin (7). While removing pin (7), install pin (13).

as. Install pin (8) in forward end of wing fold transmission when pin (7) is removed.

at. Attach wing fold pin slide hammer assembly (3) to inboard pin (7). While removing pin (7), install pin (12).

au. Take up slack on sling (1) until pins (8, 12, and 13) are snug. Remove pins (8, 12 and 13).

av. Remove outer wing from aircraft.

3. INSTALLATION.

a. Make sure electrical and hydraulic power are removed from aircraft (A1-F18AC-LMM-000).

b. Prepare transmission and inner wing for transmission installation by doing substeps below:



Petrolatum

25

(1) Apply a continuous thin coat of petrolatum on inner wing titanium tongs. Allow to dry for 20 to 25 minutes.

(2) On transmission, mask off area between inboard steel lugs.



Isopropyl Alcohol

4

(3) Wipe transmission inboard steel lugs with rymple cloth dampened with isopropyl alcohol. Once surfaces are clean as determined by having no residue, remove isopropyl alcohol from surfaces with clean dry rymple cloth. Allow to dry for 10 minutes.



Cleaning Compound

8

(4) Wipe transmission inboard steel lugs with rymple cloth dampened with cleaning compound. Do not wipe dry. Allow to dry for 15 minutes.



Sealing Compound

1

NOTE

After sealing compound is applied, the transmission must be installed on inner wing within 45 minutes.

(5) Apply thick coat of sealing compound to transmission inboard steel lugs and inner wing titanium tangs. Make sure sealing compound is forced into all gaps. Do not allow air to be trapped on surfaces.

(6) Remove masking on transmission.

(7) Smooth and fill all voids of the sealing compound on transmission. Remove all excess sealing compound within one hour.

c. Attach sling (1, figure 3) to outer wing (2) and lower outer wing on wing fold transmission in the folded position.

d. Install pin (8) in outboard pin location and install pins (12 and 13).



Lubricating Oil

13

e. Lubricate pins (7) using lubricating oil.

f. Attach protector (9) to end of inboard pin (7).

NOTE

Before installing wing fold attach pin, make sure pin removal extension is positioned so that tool can be removed after installation of wing fold attach pin.

g. Attach wing fold pin slide hammer assembly (3) to inboard pin (7) and install pin (7) in wing fold transmission. Before pin (7) is completely installed, remove pin (12). After pin (7) is installed, remove protector (9), (A1-F18AC-SRM-410).

h. Attach protector (9) to end of outboard pin (7).

i. Remove pin (8) from wing fold transmission.

NOTE

Before installing wing fold attach pin, make sure pin removal extension is positioned so that tool can be removed after installation of wing fold attach pin.

j. Attach wing fold pin slide hammer assembly (3) to outboard pin (7) and install pin (7) in wing fold transmission. Before pin (7) is completely installed, remove pin (13). After pin (7) is installed, remove protector (9).

k. Install washers (6), nuts (5) and cotter pins (4), on forward end of pins (7) and safety with MS24665-151 pin. (QA)

l. Install bolt (14) and attaching hardware through arm. Torque nut to 12 to 15 inch-pounds and install cotter MS24665-151 pin. (QA) Remove tape from flipper door.



Make sure support clears outer wing during operation, or damage could result in outer wing.

m. Manually lower outer wing (2) while lowering hoist.

n. Remove sling (1) from outer wing.

o. In cockpit, push in wing fold handle.

p. Disengage pin (16, figure 2).

q. Install washers (5, figure 3), nuts (6) and cotter pins (4), on aft end of pins (7) and safety with MS24665-151 cotter pins. (QA)

r. Pull wire bundle that was left with inner wing through hole in structure and into door 83L (or 83R) area.

s. Install clamps (1 and 2, figure 2) and attaching hardware.

t. Route wire bundles within door 83L (or 83R) area and install connectors (6, 10, 12, and 14) and ground (4).

u. Install clamps (5, 7, 11, 13, and 15) and attaching hardware.

v. Clean out hydraulic fluid from flipper door area, door 83L (or 83R) area and install wing fold swivel and shear pin (A1-F18AC-570-300, WP059 00).

w. Install aileron shroud (A1-F18AC-570-300, WP010 00).

x. Install support (11, figure 3) and attaching hardware to outer wing.

y. Install bolt (10) through support and install attaching hardware. Torque nut to 30 to 40 inch-pounds and install MS24665-151 cotter pin. (QA)

z. If outboard leading edge flap was not removed, go to step ay. If flap was removed, continue with next step.



Grease, Aircraft

14

NOTE

Note part number of expandable bolt (5) before installation for future reference in procedure.

aa. Coat all parts and voids on expandable bolts (4, figure 1) with aircraft grease.

ab. Install protector (3) on expandable bolt (4) and tighten nut (6) on expandable bolt (4) until freeplay is removed from expandable bolt (4).

ac. Position outboard leading edge flap and flap transmission on aircraft and install pin set (1 and 2) in lower hinge attach point.

ad. Support outboard leading edge flap and flap transmission and secure to wing upper hinge attach point by installing expandable bolt (4) in inboard direction.

ae. Remove protector (3) from upper expandable bolt (4).

af. Install protector (3) on lower expandable bolt (4) and tighten nut (6) until freeplay is removed from expandable bolt (4).

ag. Support transmission and remove pin set (1 and 2) from lower attach point.

ah. Support outboard leading edge flap and flap transmission and secure to wing lower attach point by installing expandable bolt (4) in inboard direction.

ai. Remove protector (3) from lower expandable bolt (4).

aj. On bolt (4) part number SL52021-207, do sub-steps below:

(1) Install spacer and nut on inboard upper and lower bolts (4) so castellated end of nuts are 0.04 to 0.06 inch from end of bolt. (QA)

(2) Adjust outboard nuts so castellated end of nuts are 0.50 to 0.52 inch from end of bolts (4). (QA)

(3) Temporarily install shaft (13).

NOTE

The accuracy of gap dimension depends on knowing the correct amount of thread extension.

(4) Restrain end of upper bolt (4) at internal wrenching socket and while vigorously shaking transmission up and down, alternately turn each nut slowly one turn with a torque wrench.

(5) Measure gap between inboard spacer and wing structural lug. Dimension should be, gap dimension 0.49 to 0.43, thread extension, inboard end 0.09, outboard end 0.55 (see detail C). (QA)

(6) If gap is not correct, lightly tap bolt (4) with soft mallet.

(7) Repeat substeps (4) thru (6) until torque on nuts is 65 to 75 inch-pounds, except use table below: (QA)

NOTE

Thread extension is given for one complete turn. If 65 to 75 inch-pound torque is arrived at before a complete turn, the thread extension will be proportional to the previous and upcoming thread extension.

(8) After substep (7) is completed, determine that the gap is correct by doing substeps below:

(a) Get and record total thread extension from both inboard and outboard ends of bolt (4). (QA)

2. (QA) (b) Divide and record total in substep (a) by

(c) Get gap dimension by subtracting total arrived at in substep (b) from .78. This shall equal actual aircraft gap dimension within ± 0.03 inch. (QA)

ak. On bolt (4) part number SL52021-211, do sub-steps below:

(1) Install spacer and nut on inboard end of upper and lower bolts (4).

(2) Temporarily install shaft (13).

(3) Restrain end of upper bolt (4) at internal wrenching socket and, while vigorously shaking flap up and down, alternately turn each nut slowly one full turn.

(4) Center the fourth spacer from the inboard end of bolt (4) between the lug sets within ± 0.03 inch. (QA)

(5) Alternately tighten the nuts on bolt (4) to a torque of 65 to 75 inch-pounds keeping the fourth spacer from the inboard end of bolt (4) centered between the lug sets within ± 0.03 inch. To assist in recentering bolt (4), as torque increases, tap bolt (4) lightly with a soft mallet until recentered within ± 0.03 inch. (QA)

al. Repeat step k or l for lower bolt (4).

GAP DIMENSION	THREAD EXTENSION	
	INBOARD END	OUTBOARD END
0.46 to 0.40 2 turns	0.12	0.58
0.42 to 0.36 3 turns	0.16	0.62
0.39 to 0.33 4 turns	0.19	0.65
0.35 to 0.29 5 turns	0.23	0.69
0.32 to 0.26 6 turns	0.26	0.73
0.28 to 0.22 7 turns	0.30	0.76
0.24 to 0.19 8 turns	0.34	0.80

am. Install MS24665-86 cotter pins on nuts (6 and 15) on upper and lower expandable bolts (4). (QA)

an. Add washers (5) to reduce gap between hinge lugs and spacers to 0.005 to 0.035 inch. (QA)

ao. Remove bolt (14) and shaft (13).

ap. Install bolt (7) and attaching hardware on outboard end of transmission stabilizing attach point. Torque nut 30 to 40 inch-pounds. (QA)

aq. Install bolt (12) and attaching hardware on outboard end of transmission stabilizing attach point. Torque nut 20 to 25 inch-pounds and install MS24665-151 cotter pin. (QA)

ar. Install bonding lead (8) on outboard end of asymmetry control by installing bolt (9) and attaching hardware.

as. Connect connectors (10 and 11) to asymmetry control.

at. While pulling down on leading edge of inboard and outboard leading flaps, manually turn splined input to outboard leading edge flap transmission as required to align lower moldline of outboard leading edge flap with ± 0.06 inch of lower moldline of inboard leading edge flap. (QA)

au. Grease splines using aircraft grease and install shaft (13).



Bolts are installed to prevent telescoping of torque shafts. Do not preload bolts or binding of shaft splines will occur.

av. Install bolt (14) and attaching hardware on shaft (13) to provide a 0.000 to 0.010 inch maximum end play on bolt (14) install MS24665-86 cotter pin. (QA)

aw. Install bolt (24) and attaching hardware, securing support (23) to outer wing.

ax. Install bolt (25) and attaching hardware, securing support (26) to outer wing.

ay. Remove trailing edge flap control surface aircraft ground safety lock (A1-F18AC-PCM-000).

az. Do rigging (A1-F18AC-570-300, WP030 00).

ba. Remove external hydraulic and electrical power from aircraft (A1-F18AC-LMM-000).

bb. Install doors 83L (or 83R), 91L (or 91R), 93L (or 93R), 95L (or 95R), 142L (or 142R), 152L (or 152R), 153L (or 153R), 154L (or 154R), 156L (or 156R), 181L (or 181R), 182L (or 182R), 183L (or 183R), 185L (or 185R), 187L (or 187R), 188L (or 188R) and 189L (or 189R) (A1-F18AC-LMM-010).

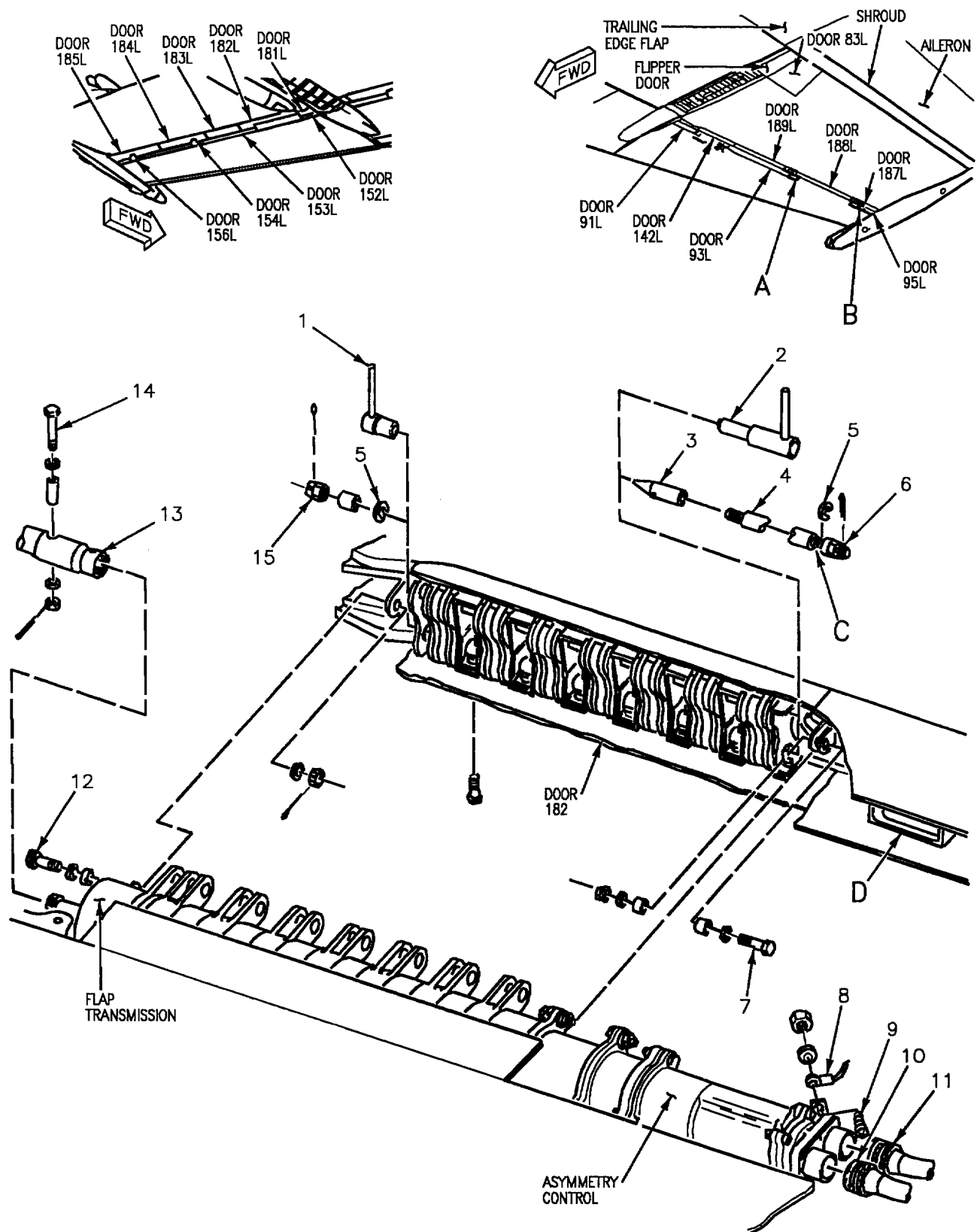
bc. Apply electrical and hydraulic power to aircraft (A1-F18AC-LMM-000).

bd. Lower outboard flap.

be. Remove hydraulic and electrical power to aircraft (A1-F18AC-LMM-000).

bf. Install Guided, Missile Launcher, LAU-7/A-4 (A1-F18AC-740-300, WP024 00).

bg. Install door 190L (or 190R) and attaching hardware to outer wing.



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Figure 1. Outer Wing Leading Edge Flap (Sheet 1)

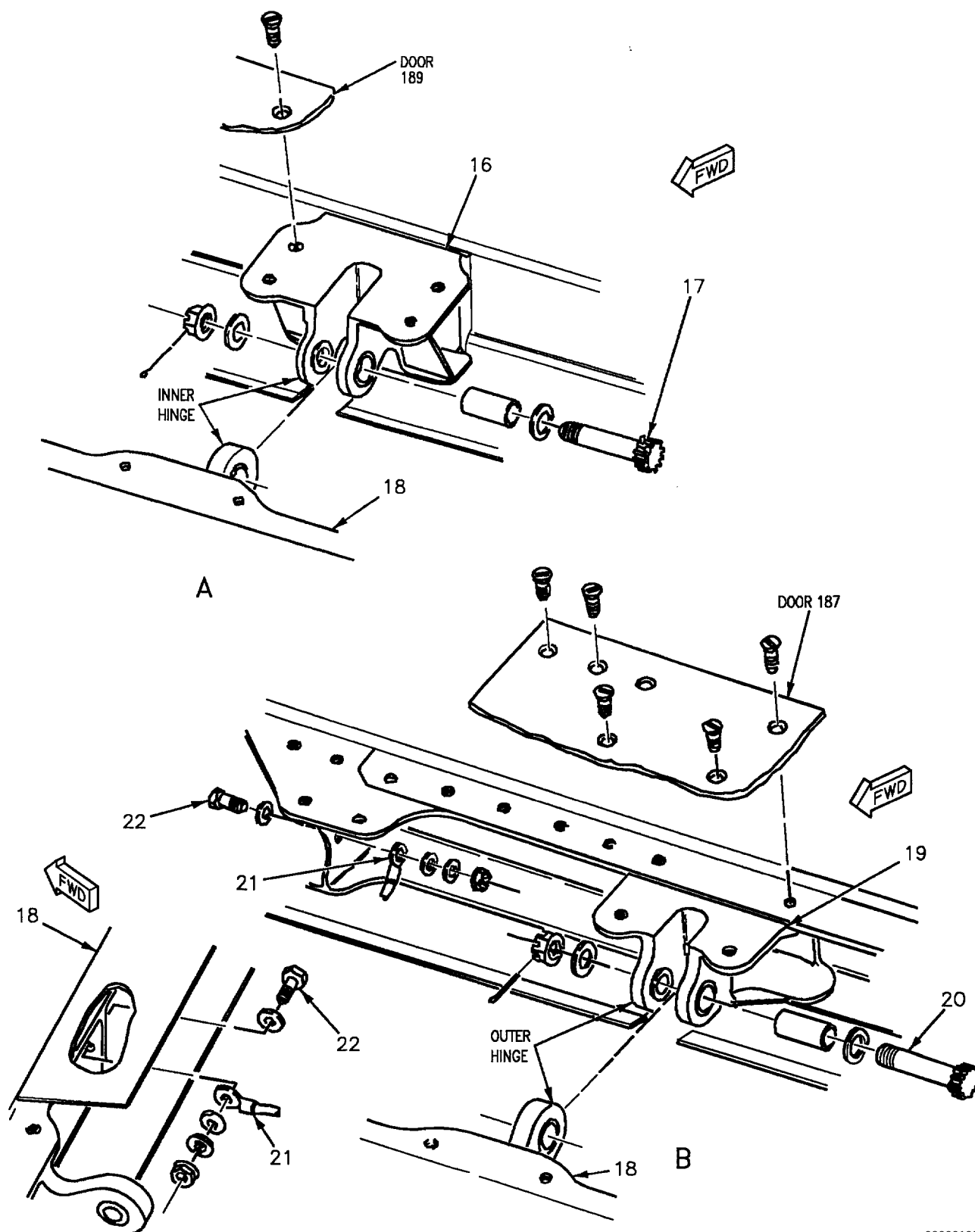


Figure 1. Outer Wing Leading Edge Flap (Sheet 2)

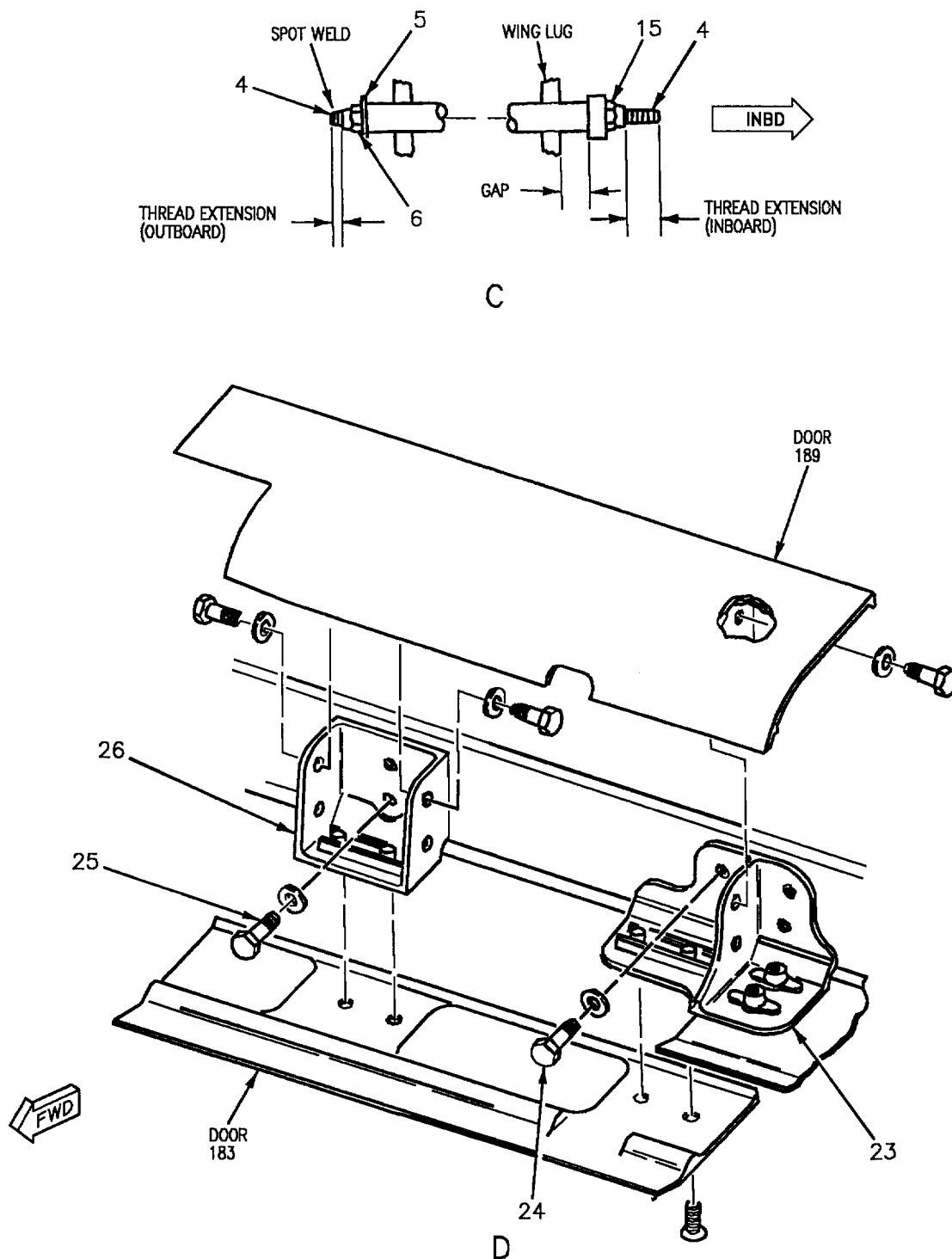


Figure 1. Outer Wing Leading Edge Flap (Sheet 3)

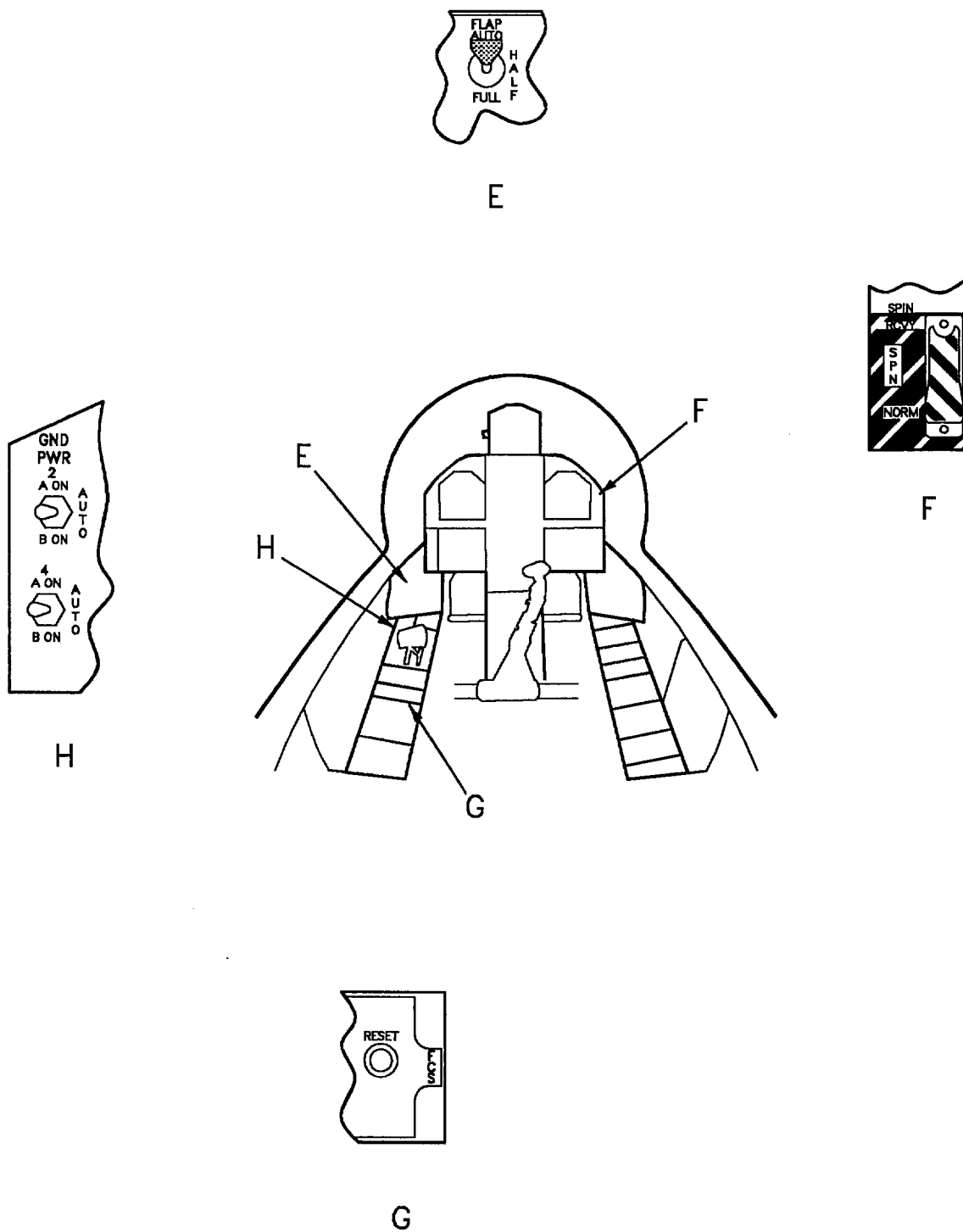


Figure 1. Outer Wing Leading Edge Flap (Sheet 4)

INDEX NO.	NOMENCLATURE
1	PIN ASSEMBLY, (PART OF PIN SET 74D110060-2013)
2	PIN ASSEMBLY, (PART OF PIN SET 74D110060-2015)
3	PROTECTOR, (PART OF PIN SET 74D110043-1003)
4	BOLT EXPANDABLE
5	WASHER SPECIAL
6	NUT
7	BOLT
8	LEAD
9	BOLT
10	CONNECTOR
11	CONNECTOR
12	BOLT
13	SHAFT ASSEMBLY
14	BOLT
15	NUT
16	HINGE HALF
17	BOLT
18	FLAP
19	HINGE HALF
20	BOLT
21	LEAD
22	BOLT
23	SUPPORT
24	BOLT
25	BOLT
26	SUPPORT

Figure 1. Outer Wing Leading Edge Flap (Sheet 5)

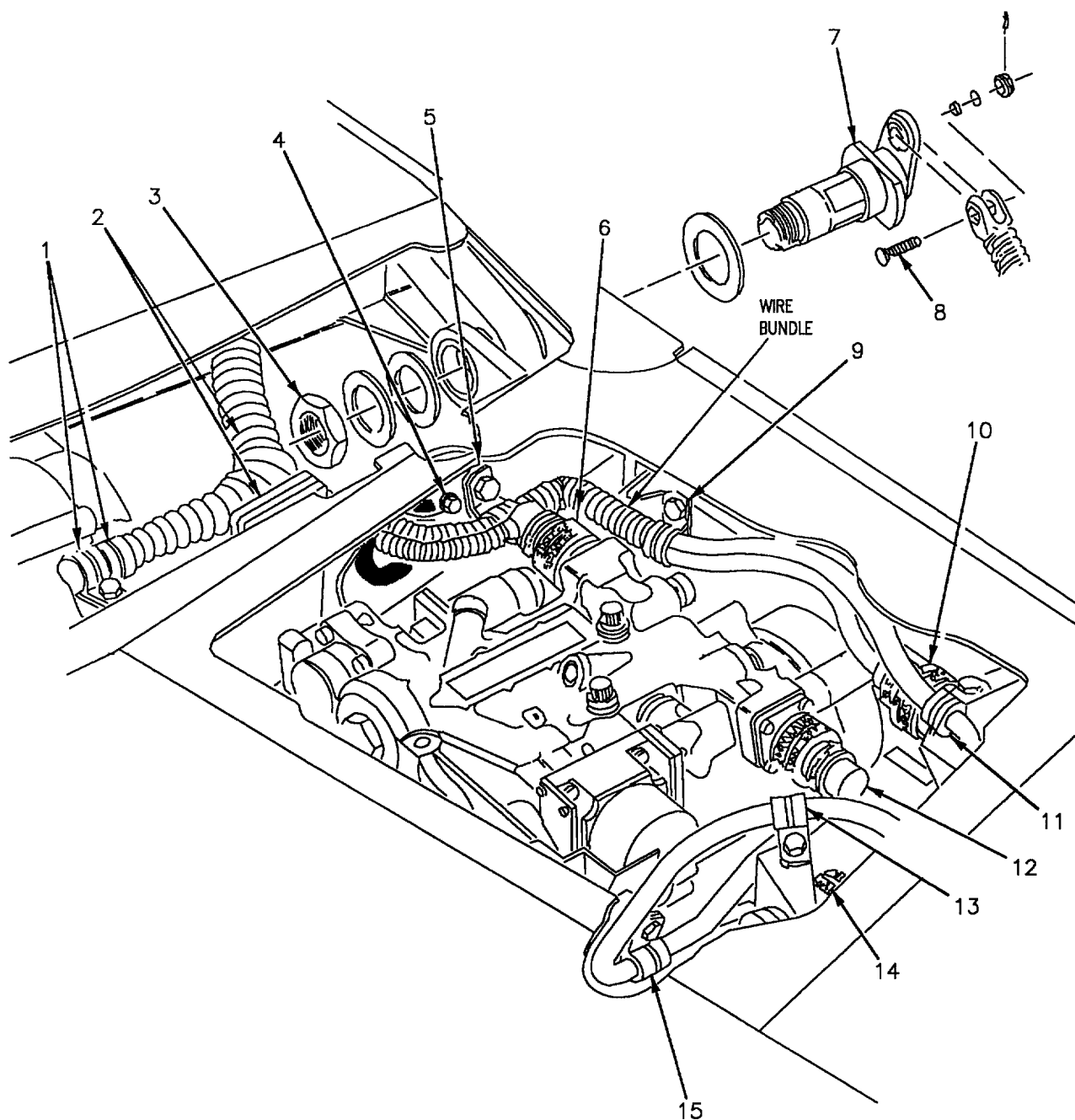
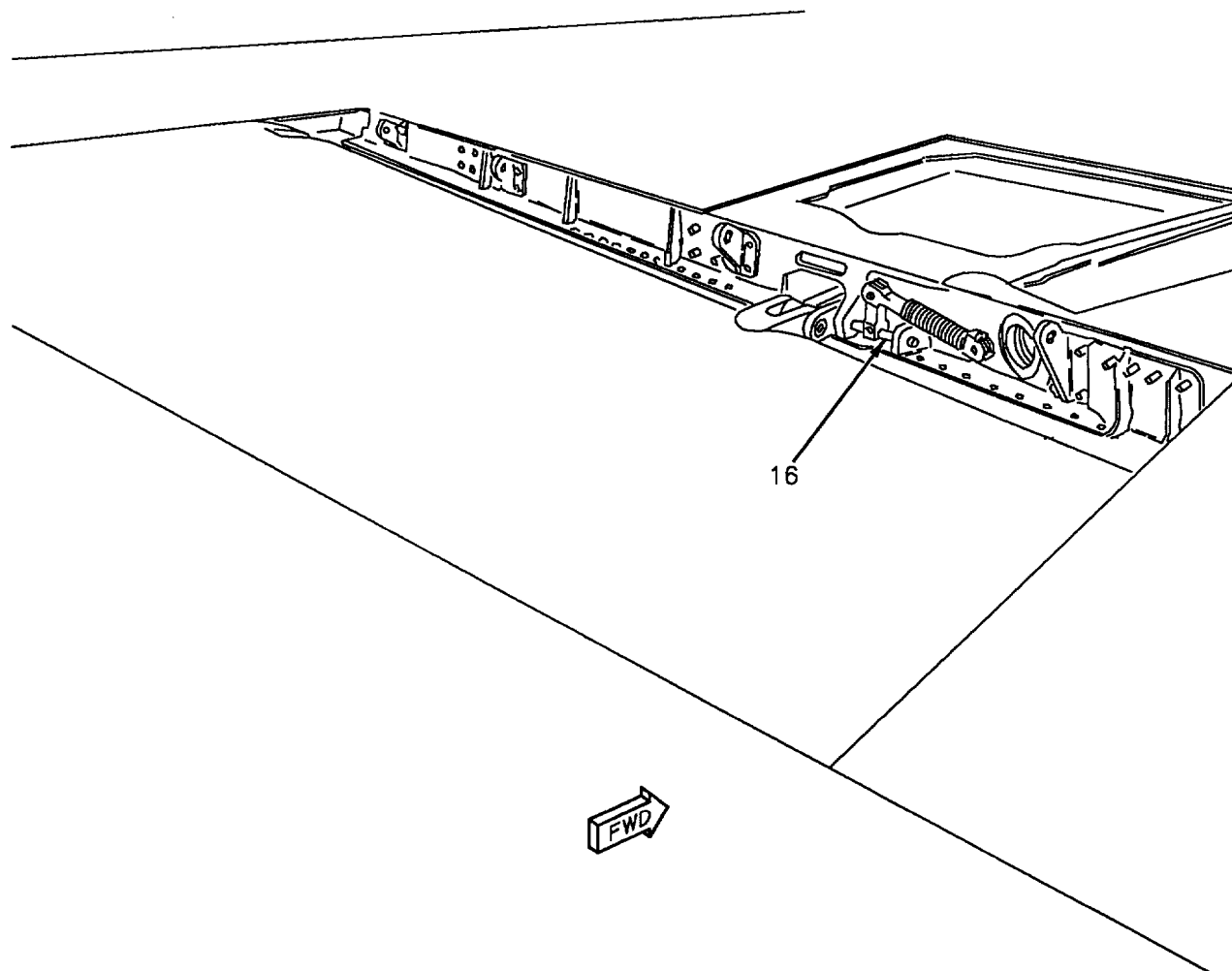
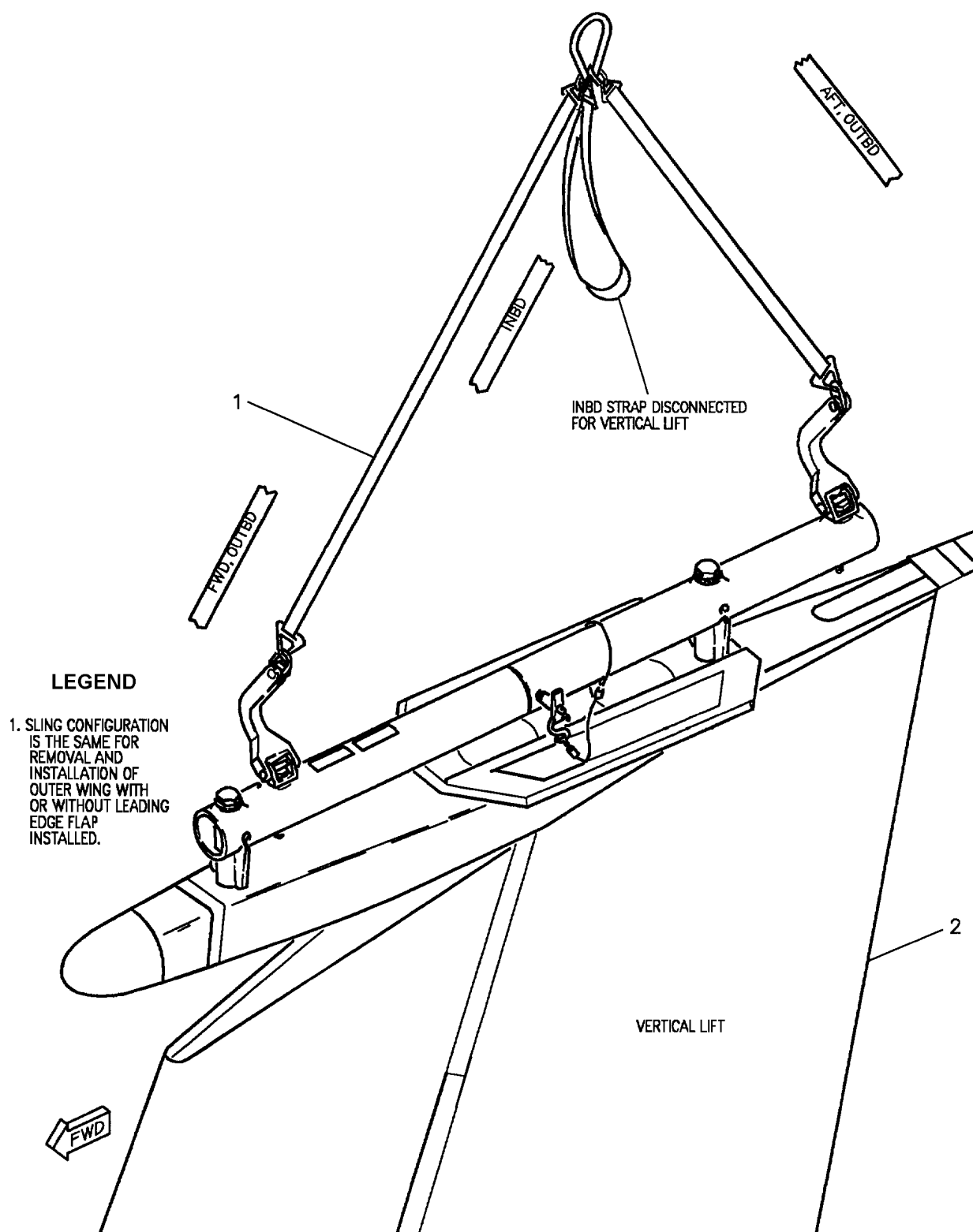


Figure 2. Outer Wing Pin (Sheet 1)



INDEX NO	NOMENCLATURE	INDEX NO	NOMENCLATURE
1	CLAMP	9	CLAMP
2	CLAMP	10	CONNECTOR
3	NUT	11	CLAMP
4	GROUND	12	CONNECTOR
5	CLAMP	13	CLAMP
6	CONNECTOR	14	CONNECTOR
7	PIN	15	CLAMP
8	SCREW	16	PIN

Figure 2. Outer Wing Pin (Sheet 2)



02000301

Figure 3. Outer Wing Removal and Installation (Sheet 1)

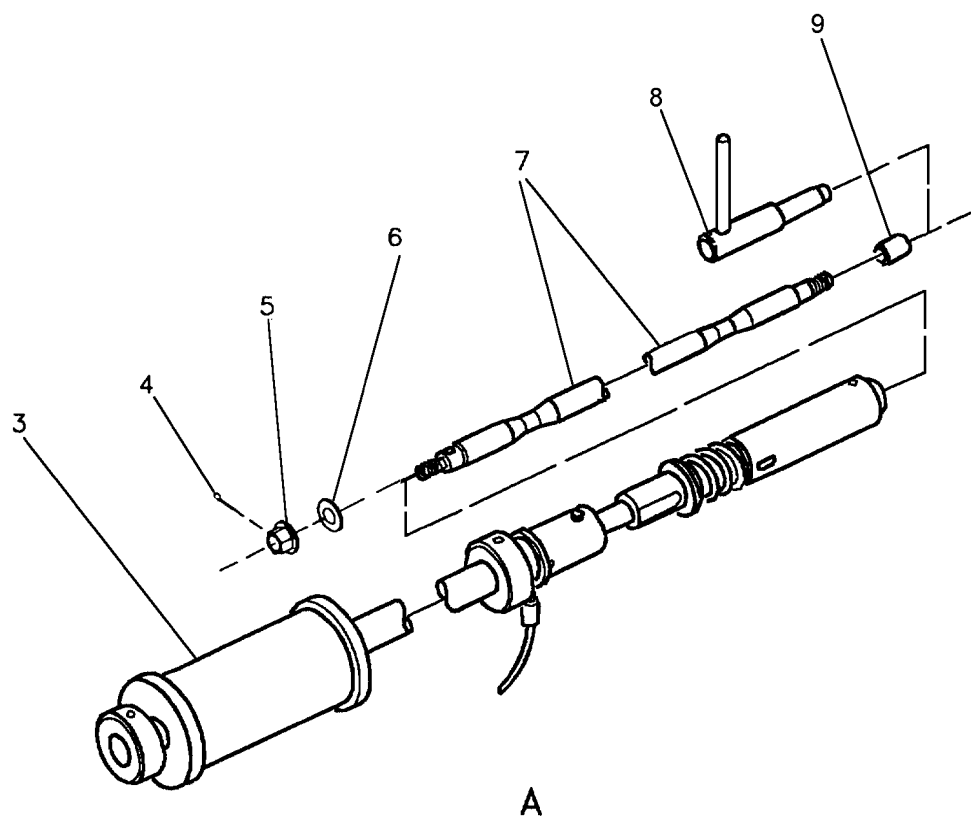
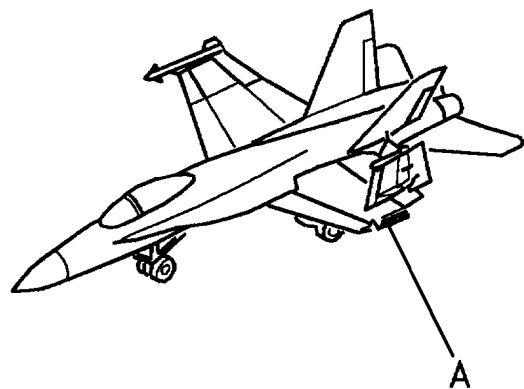


Figure 3. Outer Wing Removal and Installation (Sheet 2)

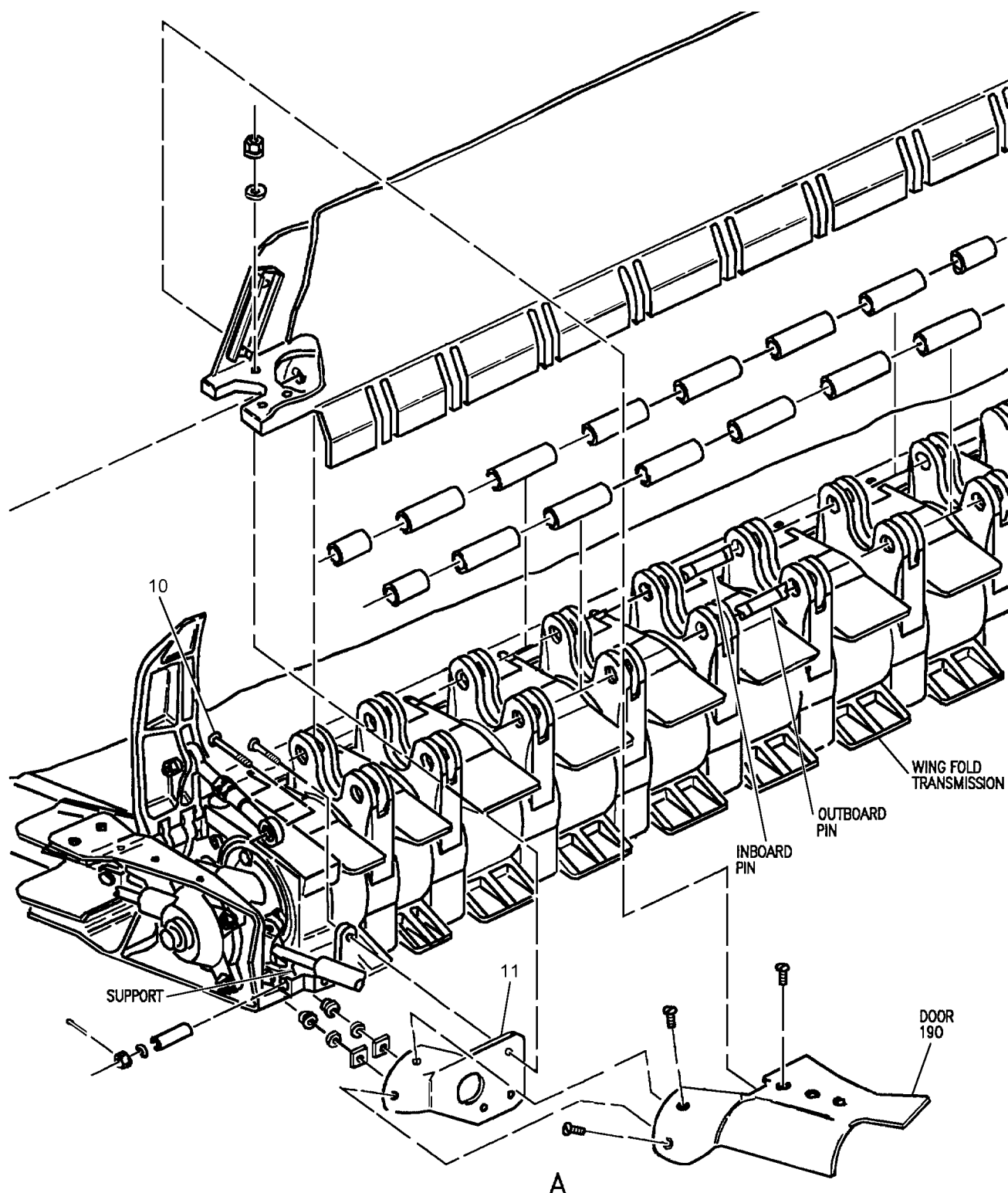
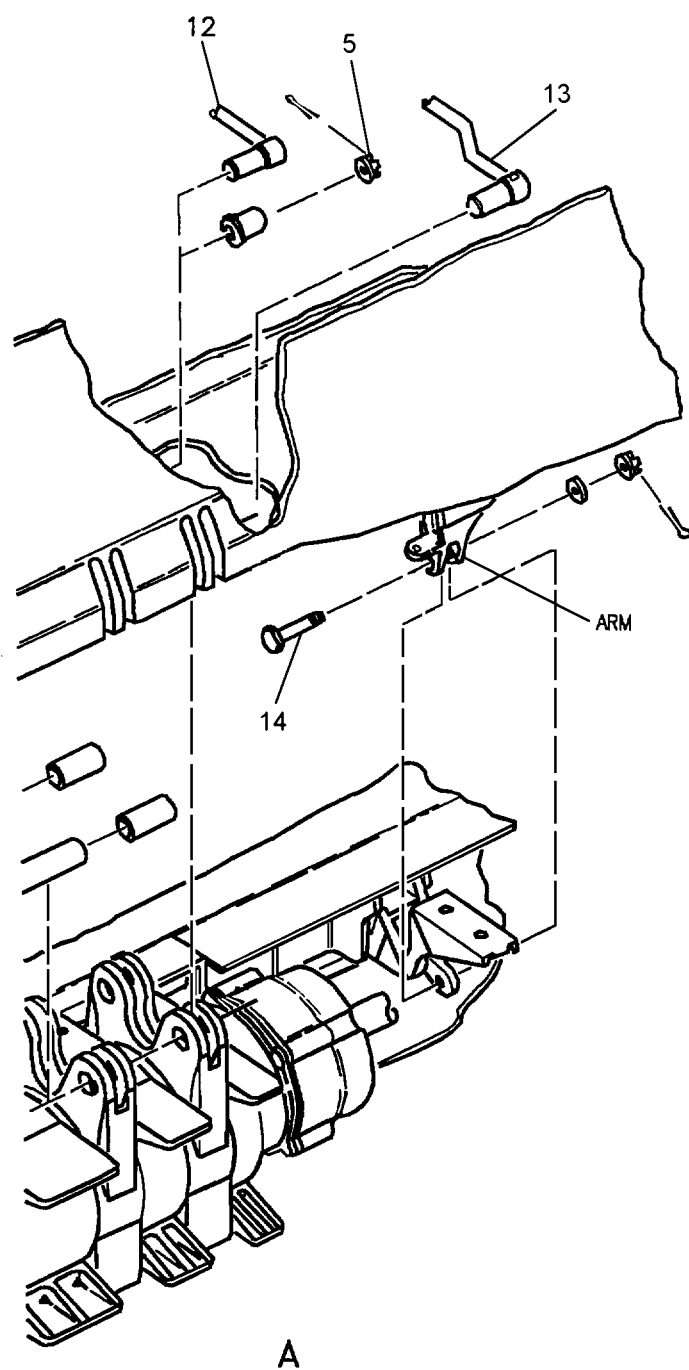


Figure 3. Outer Wing Removal and Installation (Sheet 3)



INDEX NO	NOMENCLATURE
1	SLING
2	WING, OUTER
3	SLIDE HAMMER ASSEMBLY, (PART OF ADAPTER SET 74D110043-1003)
4	COTTER PIN
5	NUT
6	WASHER
7	PIN
8	PIN ASSEMBLY (PART OF PIN SET 74D110060-2001)
9	PROTECTOR (PART OF ADAPTER SET 74D110043- 1003)
10	BOLT
11	SUPPORT
12	PIN ASSEMBLY (PART OF PIN SET 74D110060-2043)
13	PIN ASSEMBLY (PART OF PIN SET 74D110060-2045)
14	BOLT

Figure 3. Outer Wing Removal and Installation (Sheet 4)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

OUTER WING REPLACEMENT

Reference Material

Structure Repair - Wing	A1-F18AC-SRM-210
Outer Wing External Doors, Upper	WP013 00
Outer Wing External Doors, Lower	WP014 00
Outer Wing Removal and Installation	WP020 00
Strain Gages	WP023 00
Cable Assemblies	A1-F18AC-WRM-040
74A754205 Left Wing Cable Assembly	WP542 05
74A754207 Left Wing Cable Assembly	WP542 07
74A754209 Left Wing Cable Assembly	WP542 09
74A754210 Left Wing Cable Assembly	WP542 10
74A754215 Left Wing Cable Assembly	WP542 15
74A755205 Right Wing Cable Assembly	WP552 05
74A755207 Right Wing Cable Assembly	WP552 07
74A755209 Right Wing Cable Assembly	WP552 09
74A755210 Right Wing Cable Assembly	WP552 10
74A755215 Right Wing Cable Assembly	WP552 15
Integrated Flight Controls	A1-F18AC-570-300
Aileron (84MPU525 or 84MPV526) or Aileron Shroud (84MPU527 or 84MPV528)	WP010 00
Aileron Servocylinder (84A-U019 or 84A-V020)	WP011 00
Lighting System	A1-F18AC-440-300
Position Lights	WP005 00
Formation Lights	WP006 00
Lightning Arresters	WP009 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Weapons Control System	A1-F18C-740-300
Wing Tip Command Signal Encoder-Decoder KY-851/AYQ-9(V) (61A-U011 or 61A-V019)	WP007 00
Wiring Repair with Parts Data General Wiring Repair Procedures	A1-F18AC-WRM-000

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Removal	2

Record of Applicable Technical Directives

None

Support Equipment Required

Nomenclature	Part Number or Type Designation
Torque Wrench, 0 to 120 Inch-Pounds	-

Materials Required

None

1. REPLACEMENT.

2. These procedures are for the left outer wing. Procedures for right outer wing are identical except as indicated.

3. REMOVAL.

a. Remove existing door 159 (A1-F18AC-LMM-010).

b. Remove encoder-decoder command signal KY-851/AVQ-9(V) (A1-F18AC-740-300, WP007 00).

c. Remove outer wing (WP020 00), and place on a transportation dolly.

d. Remove existing doors 83 and 84 and retain for reinstallation on this removed outer wing panel (A1-F18AC-LMM-010).

e. Remove aileron shroud (A1-F18AC-570-300, WP010 00).

f. Remove aileron (A1-F18AC-570-300, WP010 00).

g. Remove aileron servocylinder, hydraulic tubing and attaching hardware (A1-F18AC-570-300, WP011 00).

h. Remove supplement position light and transformer (A1-F18AC-440-300, WP005 00).

i. Remove wing tip position light and transformer (A1-F18AC-440-300, WP005 00).

j. Remove wing tip formation light (A1-F18AC-440-300, WP006 00).

k. Remove lightning arrester (12, figure 1) (A1-F18AC-440-300, WP009 00).

l. Remove clamps (2) and attaching hardware.

m. Left side: Disconnect ground GND10-U003 (5), open splice WTU002 (9) and disconnect wires for cable assembly 74A754210 (1) (A1-F18AC-WRM-040, WP542 10 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Disconnect ground GND10-V003 (24), open splice WTV002 (22) and disconnect wires for cable assembly 74A755210 (30) (A1-F18AC-WRM-040, WP552 10 and A1-F18AC-WRM-000). Remove cable assembly.

n. Left side: Disconnect ground GND9-U13 (10), open splices WTU002 and WTU003 (9 and 11) and disconnect wires for cable assembly 74A754207 (3) (A1-F18AC-WRM-040, WP542 07 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Disconnect ground GND9-V013 (21), open splices WTV002 and WTV007 (22 and 20) and disconnect wires for cable assembly 74A755207 (30) (A1-F18AC-WRM-040, WP552 07 and A1-F18AC-WRM-000). Remove cable assembly.

o. Left side: Disconnect grounds GND1-U002 and GND9-U001 (4 and 8), open splice WTU002 (9) and disconnect wires for cable assembly 74A754215 (13) (A1-F18AC-WRM-040, WP542 15 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Disconnect grounds GND4-V003, GND2-V004, and GND9-V004 (26, 27, and 28), open splice WTV002 (22) and disconnect wires for cable assembly 74A755215 (32) (A1-F18AC-WRM-040, WP552 15 and A1-F18AC-WRM-000). Remove cable assembly.

p. Left side: Disconnect ground GND9-U010 (6), open splice WTU002 (9) and disconnect wires for cable assembly 74A754205 (14) (A1-F18AC-WRM-040,

WP542 05 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Disconnect ground GND9-V008 (25), open splice WTV002 (22) and disconnect wires for cable assembly 74A755205 (31) (A1-F18AC-WRM-040, WP552 05 and A1-F18AC-WRM-000). Remove cable assembly.

q. Remove strain gages (15) (WP023 00).

r. Left side: Disconnect grounds GND2-U006, GND9-U001, and GND10U007 (7, 8, and 17), open splice WTU002 (9) and disconnect wires for cable assembly 74A754209 (16) (A1-F18AC-WRM-040, WP542 09 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Disconnect grounds GND2-V004, GND4-V003, and GND9-V004 (27, 26 and 28). Open splice WTV002 (22) and disconnect wires for cable assembly 74A755209 (33) (A1-F18AC-WRM-040, WP552 09 and A1-F18AC-WRM-000). Remove cable assembly.

s. Reinstall doors 83 and 84 on removed outer wing panel (A1-F18AC-LMM-010).

NOTE

Retain existing outer wing until replacement outer wing has been completely built up and installed.

4. INSTALLATION.

a. Remove replacement outer wing from shipping container and place on a transportation dolly.

b. 161353 THRU 161519 the replacement outer wing has bagged loose items attached.

(1) Attach angle and gang channel (2, figure 2) bond and rivet shims (3, 4, and 5) to replacement seal (door 142) (1) (WP013 00).

(2) Attach seal (9) and retainer (8) to replacement seal (door 181) (7) (WP014 00).

(3) Bond and rivet shims (3, 4, and 5) to replacement seal (door 182) (6) (WP014 00).

(4) Install replacement supports (10). When installing outboard leading edge flap, make sure that supports (10) are installed as indicated by word "UP" engraved on supports (10) (WP020 00).

c. 161520 AND UP the replacement outer wing has bagged loose items attached.

(1) Remove existing radius block (7, figure 3), and spacer (8) from existing seal (door 190) (1). Install replacement radius block (7) and spacer on existing seal (door 190) (1) (WP013 00).

(2) Attach angle and gang channel (3), bond and rivet shims (4, 5, and 6) to replacement seal (door 142) (2) (WP013 00).

(3) Bond and rivet shims (4, 5, and 6) to replacement seal (door 182) (10) (WP014 00).

(4) Install replacement supports (11). When installing outboard leading edge flap, make sure that supports (11) are installed as indicated by word "UP" engraved on supports (11) (WP020 00).

(5) Mate drill and rivet seals (13 and 14) to replacement wing.

(6) On 161353 THRU 162414, remove existing support (12) from existing wing and install on replacement wing. Torque nuts 30 to 40 inch-pounds. (QA)

(7) On 162415 AND UP, install replacement support (12) and torque nuts 30 to 40 inch-pounds. (QA)

(8) Remove doors 83 and 84, if installed, to allow access to internal bays, and retain doors for later reinstallation (A1-F18AC-LMM-010).

d. Left side: Install existing cable assembly 74A754209 (16, figure 1). Connect grounds GND2-U006, GND9-U001, and GND10U007 (7, 8, and 17).

Right side: Install existing cable assembly 74A755209 (33). Connect grounds GND4-V003, GND2-V004 and GND9-V004 (26, 27, and 28).

e. Install strain gages (15) (WP023 00).

(1) 161353 THRU 161519 use existing strain gages.

(2) 161520 AND UP use replacement strain gages.

f. Left side: Install existing cable assembly 74A754205 (14). Connect ground GND9-U010 (6).

Right side: Install existing cable assembly 74A755205 (31). Connect ground GND9-V008 (25).

g. Left side: Install existing cable assembly 74A754215 (13). Connect grounds GND1-U002 and GND9-U001 (4 and 8).

Right side: Install existing cable assembly 74A755215 (32). Connect grounds GND4-V003, GND2-V004 and GND9-V13 (26, 27 and 28).

h. Left side: Install existing cable assembly 74A754207 (3). Connect ground GND9-U13 (10).

Right side: Install existing cable assembly 74A755207 (30). Connect ground GND9-V013 (21).

i. Left side: Install existing cable assembly 74A754210 (1). Connect ground GND10-U003 (5).

Right side: Install existing cable assembly 74A755210 (30). Connect ground GND10-V003 (24).

j. Left side: Splice wires for cable assembly 74A754209 (16) at splice WTU002 (9) (A1-F18AC-WRM-040, WP542 09 and A1-F18AC-WRM-000).

Right side: Splice wires for cable assembly 74A755209 (33) at splice WTV002 (22) (A1-F18AC-WRM-040, WP552 09 and A1-F18AC-WRM-000).

k. Left side: Splice wires for cable assembly 74A754205 (14) at splice WTU002 (9) (A1-F18AC-WRM-040, WP542 05 and A1-F18AC-WRM-000).

Right side: Splice wires for cable assembly 74A755205 (31) at splice WTV002 (22) (A1-F18AC-WRM-040, WP552 05 and A1-F18AC-WRM-000).

l. Left side: Splice wires for cable assembly 74A754215 (13) at splice WTU002 (9) (A1-F18AC-WRM-040, WP542 15 and A1-F18AC-WRM-000).

Right side: Splice wires for cable assembly 74A755215 (22) at splice WTV002 (22) (A1-F18AC-WRM-040, WP552 15 and A1-F18AC-WRM-000).

m. Left side: Splice wires for cable assembly 74A754207 (3) at splices WTU002 and WTU003 (9 and 11) (A1-F18AC-WRM-040, WP542 07 and A1-F18AC-WRM-000).

Right side: Splice wires for cable assembly 74A755207 (30) at splices WTV002 and WTV007 (22 and 20) (A1-F18AC-WRM-040, WP552 07 and A1-F18AC-WRM-000).

n. Left side: Splice wires for cable assembly 74A754210 (1) at splice WTU002 (9) (A1-F18AC-WRM-040, WP542 10 and A1-F18AC-WRM-000).

Right side: Splice wires for cable assembly 74A755210 (30) at splice WTV002 (22) (A1-F18AC-WRM-040, WP552 10 and A1-F18AC-WRM-000).

o. Close splices (9, 11, 20 and 22) (A1-F18AC-WRM-000).

p. Install clamps (2) and attaching hardware.

q. Install lightning arrester (12) (A1-F18AC-440-300, WP009 00).

r. Install wing tip formation light as below:

(1) 161353 THRU 161519 install existing light (A1-F18AC-440-300, WP006 00).

(2) 161520 AND UP install replacement light (A1-F18AC-440-300, WP006 00).

s. Install wing tip position light and transformer (A1-F18AC-440-300, WP005 00).

t. Install supplement position light and transformer (A1-F18AC-440-300, WP005 00).

u. Install aileron servocylinder, hydraulic tubing and attaching hardware (A1-F18AC-570-300, WP011 00).

v. Install aileron (A1-F18AC-570-300, WP010 00).

w. Install aileron shroud (A1-F18AC-570-300, WP010 00).

x. Install outer wing (WP020 00).

y. Install encoder-decoder command signal
KY-85/AVQ-9(V) (A1-F18AC-740-300, WP007 00).

z. Install existing doors 83 and 84 which were
previously removed (A1-F18AC-LMM-010).

aa. Install replacement fairing (door 159) (9, figure
3) (WP014 00).

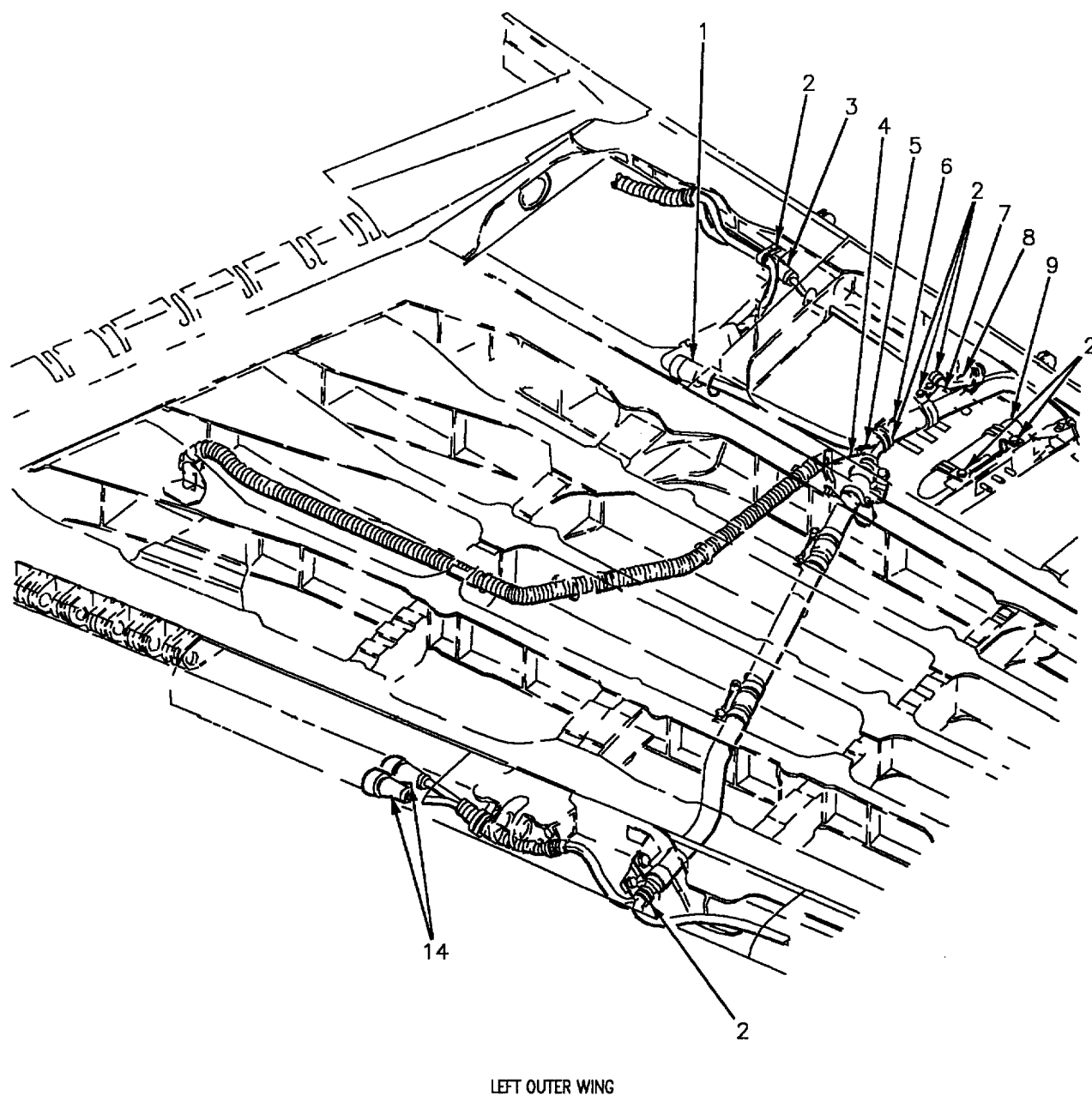


Figure 1. Electrical Component Replacement (Sheet 1)

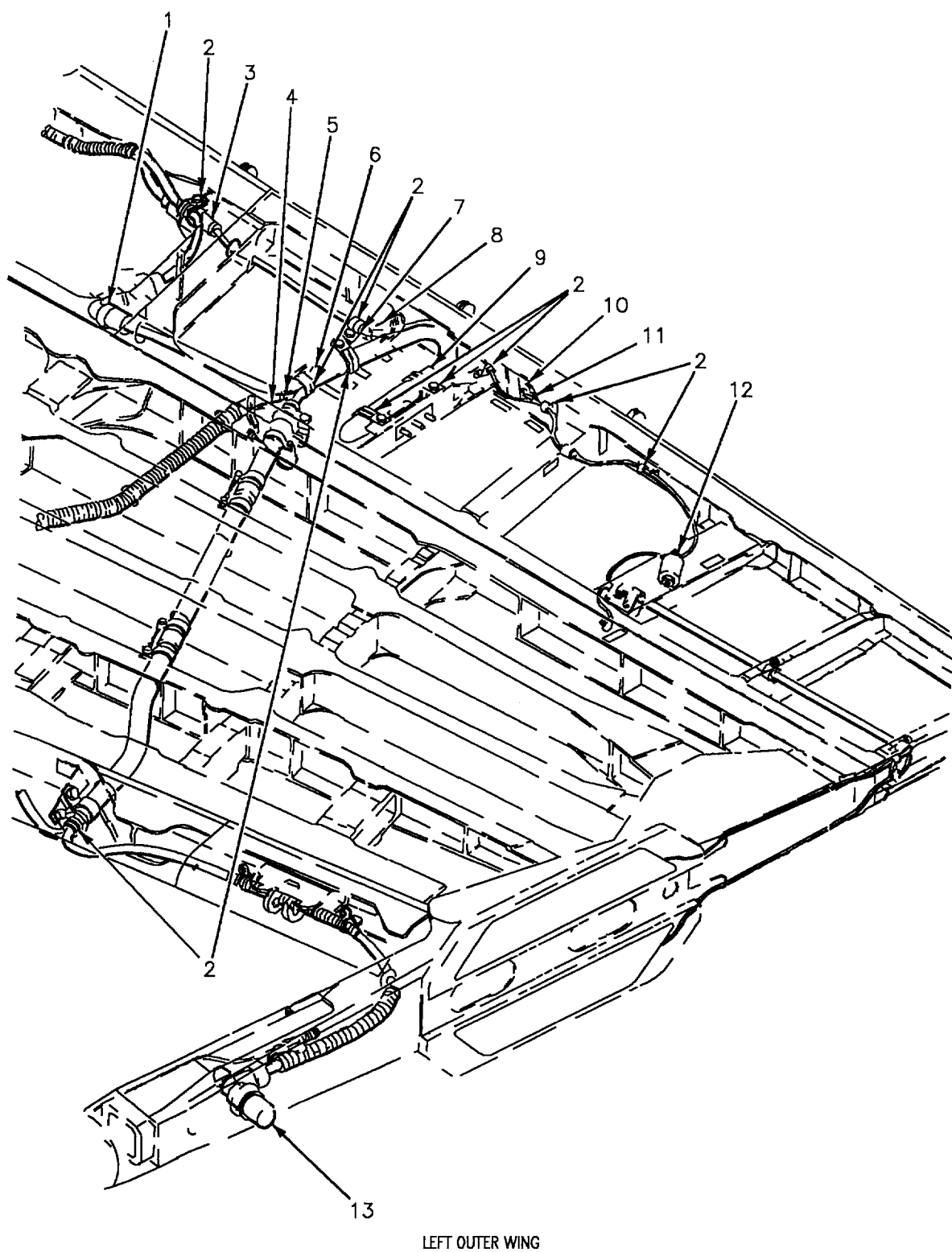


Figure 1. Electrical Component Replacement (Sheet 2)

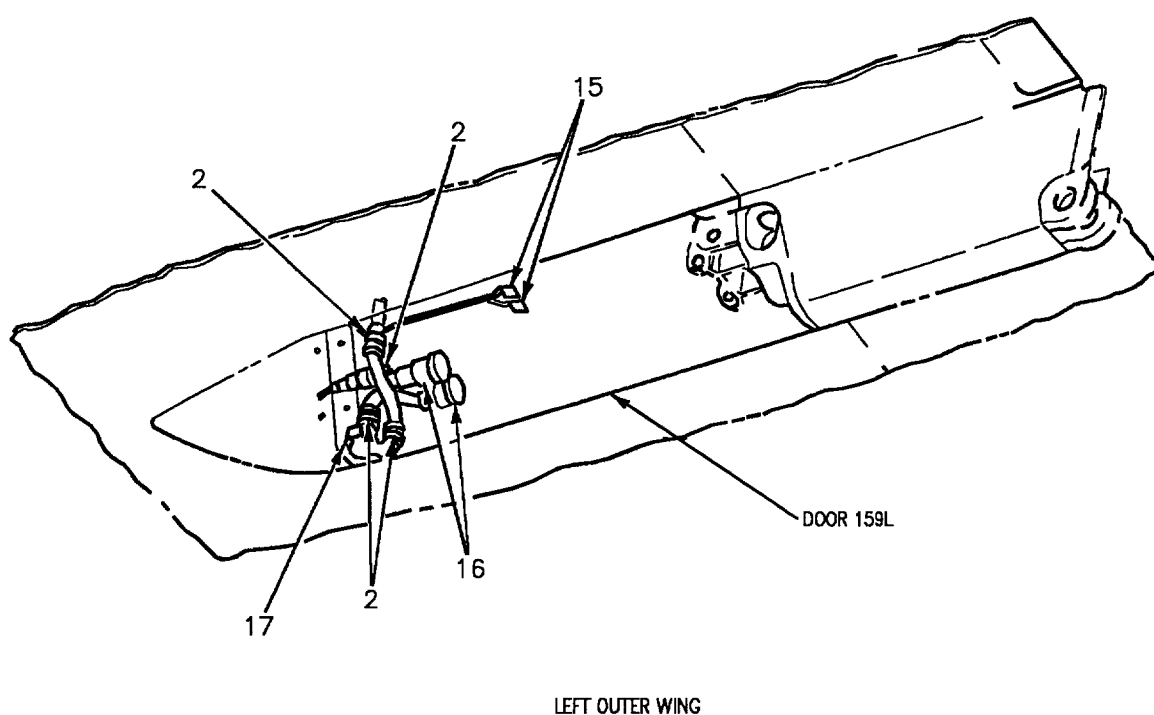


Figure 1. Electrical Component Replacement (Sheet 3)

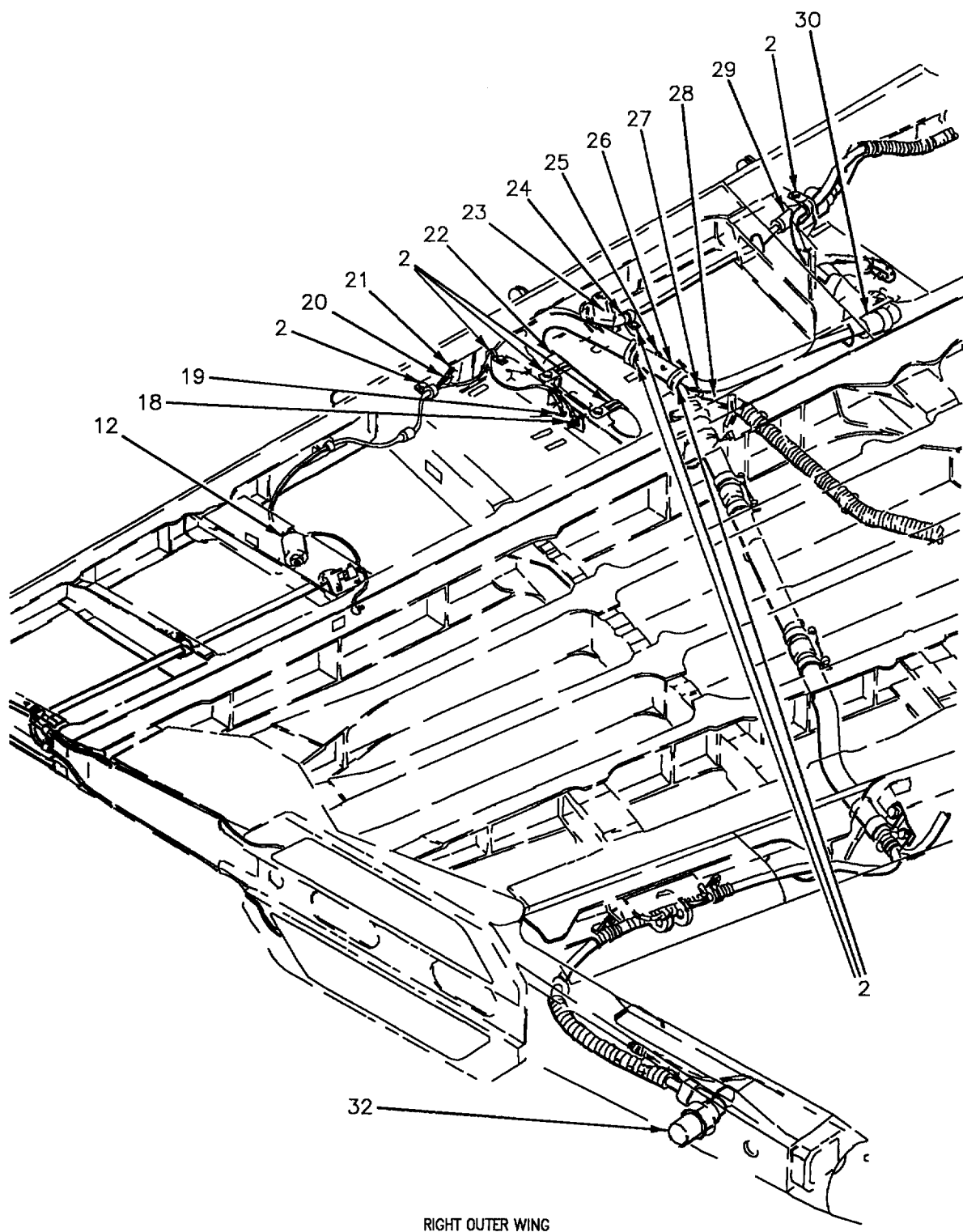


Figure 1. Electrical Component Replacement (Sheet 4)

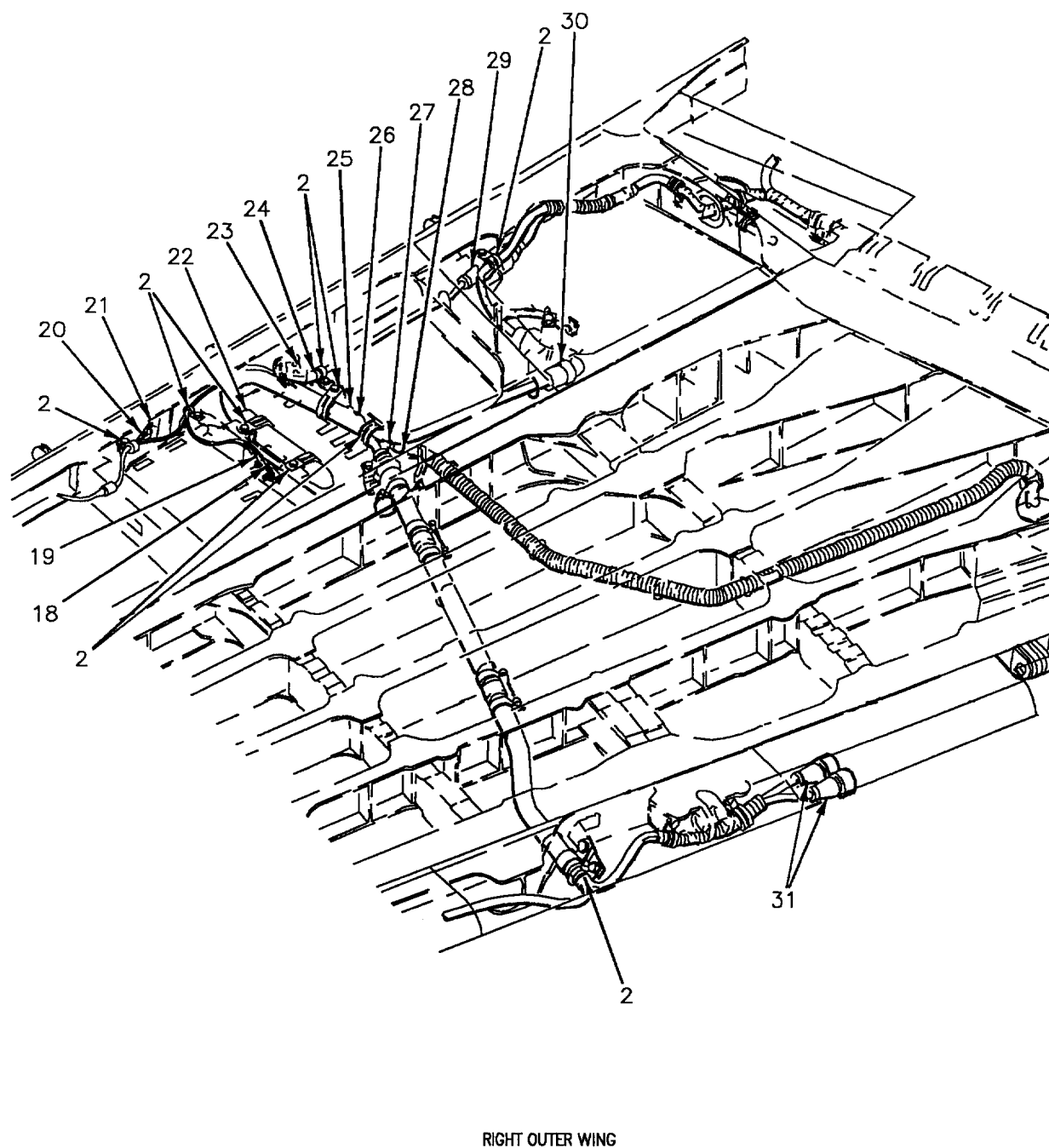


Figure 1. Electrical Component Replacement (Sheet 5)

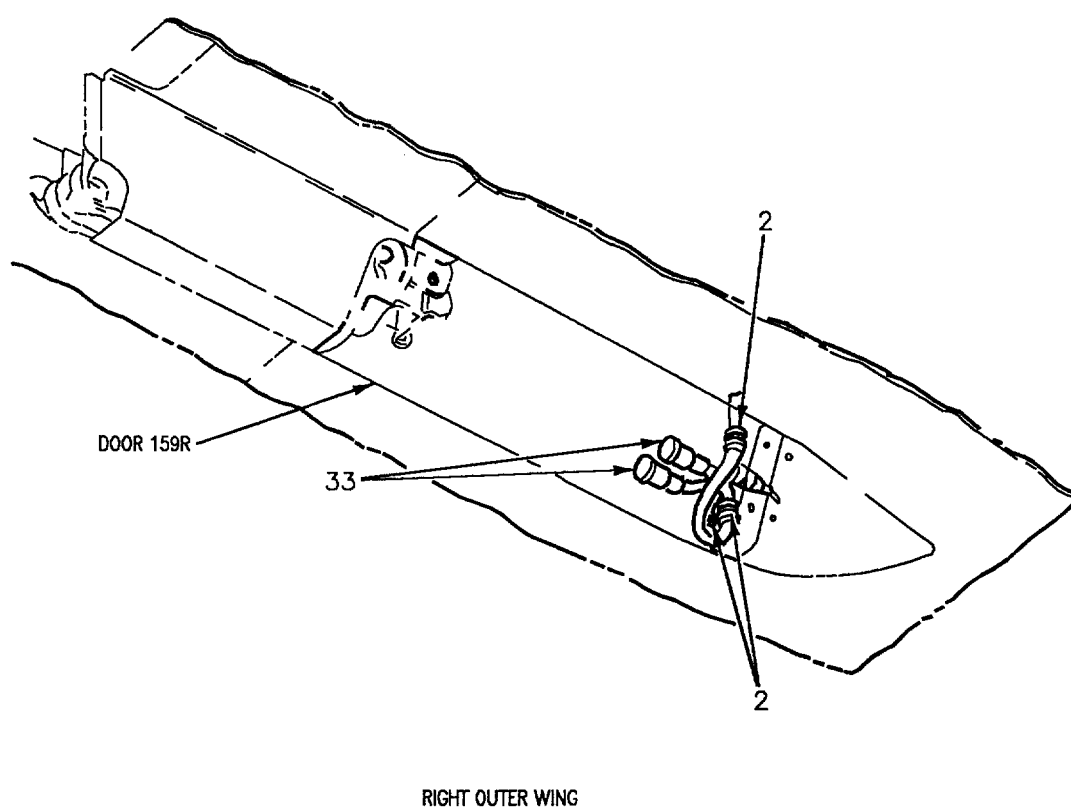
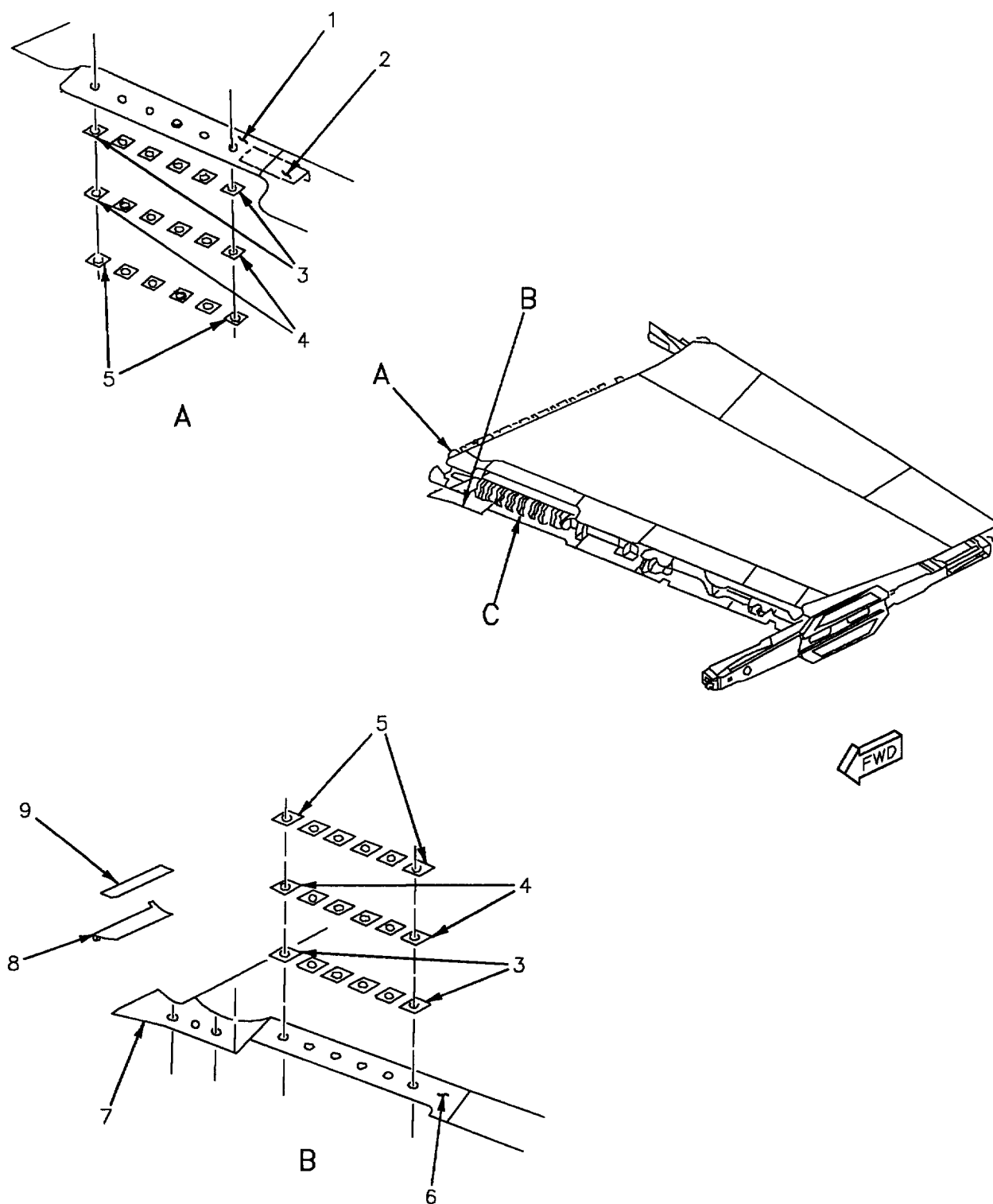
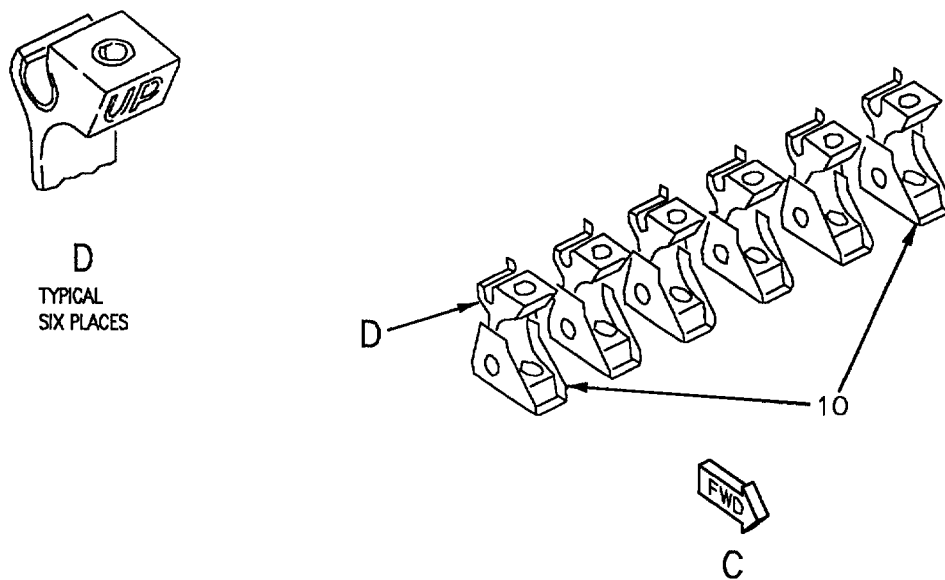


Figure 1. Electrical Component Replacement (Sheet 6)

INDEX NO.	NOMENCLATURE
1	CABLE ASSEMBLY
2	CLAMP
3	CABLE ASSEMBLY
4	GROUND
5	GROUND
6	GROUND
7	GROUND
8	GROUND
9	SPLICE
10	GROUND
11	SPLICE
12	LIGHTNING ARRESTER
13	CABLE ASSEMBLY
14	CABLE ASSEMBLY
15	STRAIN GAGE
16	CABLE ASSEMBLY
17	GROUND
18	GROUND
19	GROUND
20	SPLICE
21	GROUND
22	SPLICE
23	GROUND
24	GROUND
25	GROUND
26	GROUND
27	GROUND
28	GROUND
29	CABLE ASSEMBLY
30	CABLE ASSEMBLY
31	CABLE ASSEMBLY
32	CABLE ASSEMBLY
33	CABLE ASSEMBLY

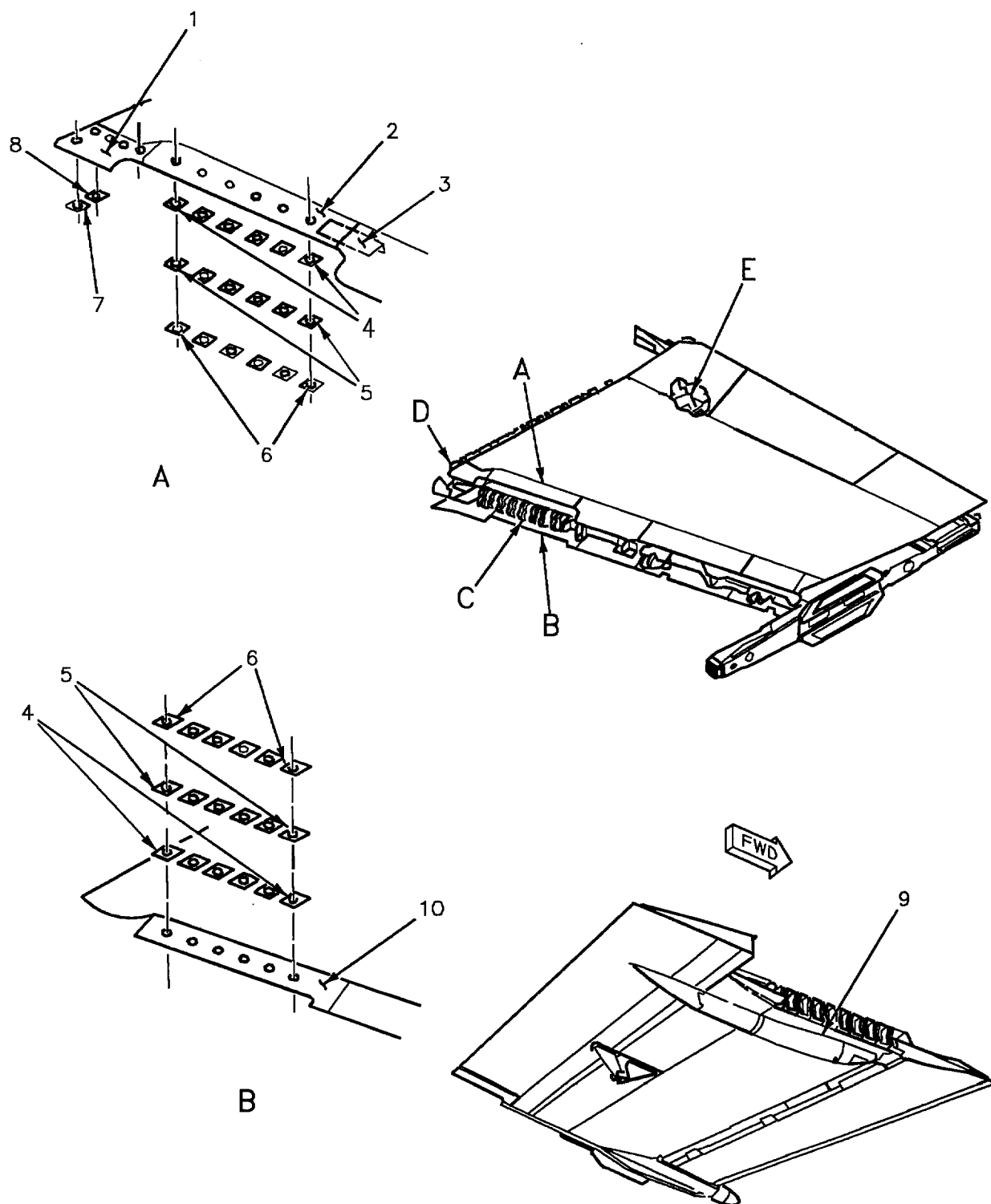
Figure 1. Electrical Component Replacement (Sheet 7)





INDEX NO.	NOMENCLATURE
1	SEAL (DOOR 142)
2	ANGLE
3	SHIMS
4	SHIMS
5	SHIMS
6	SEAL (DOOR 182)
7	SEAL (DOOR 181)
8	RETAINER
9	SEAL
10	SUPPORT

Figure 2. Wing Replacement 161353 THRU 161519 (Sheet 2)



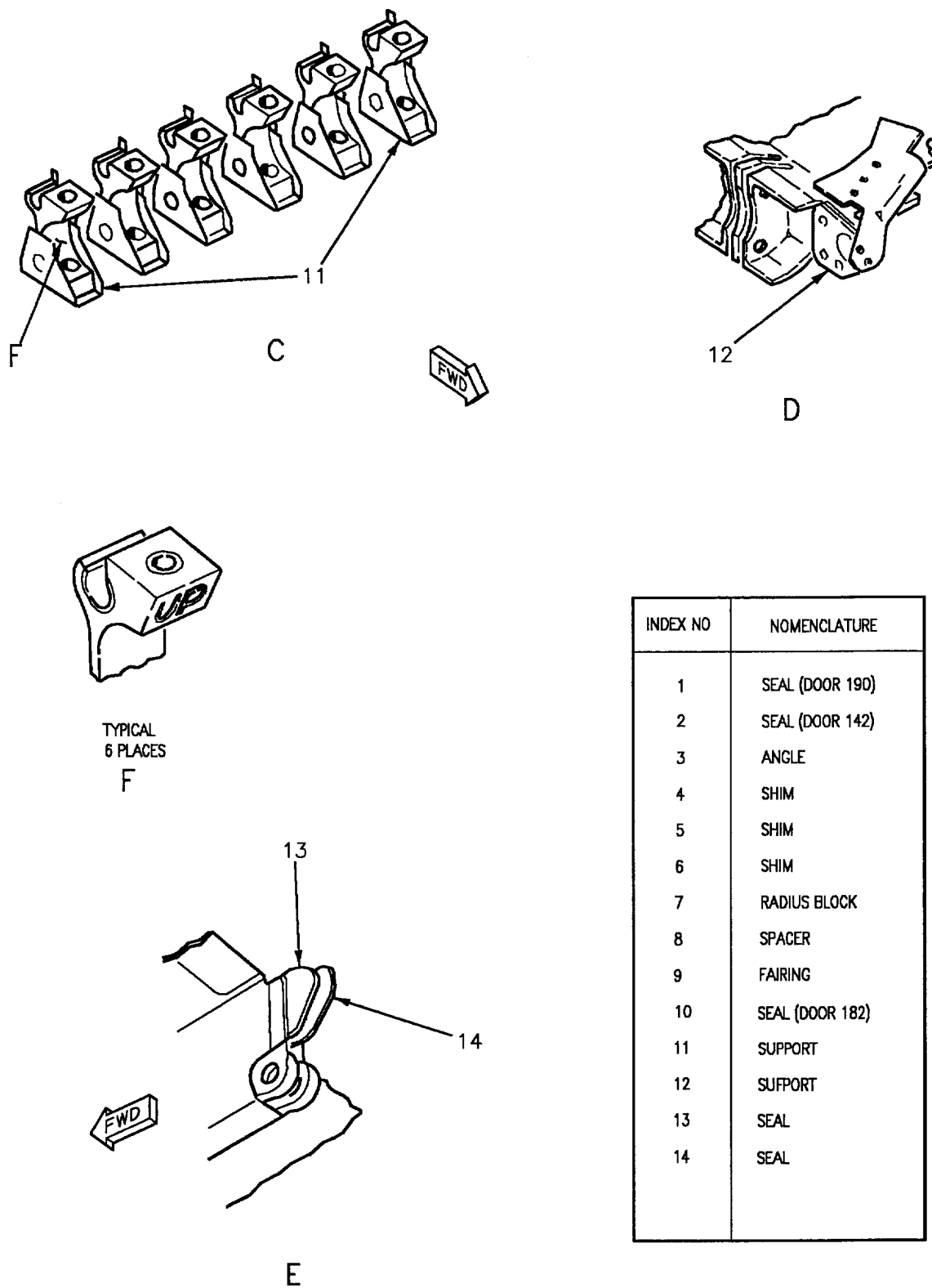


Figure 3. Wing Replacement 161520 AND UP (Sheet 2)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

OUTER WING

FREE PLAY INSPECTION AND WEAR TOLERANCES

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Outer Wing Structure	WP012 00
Outer Wing Removal and Installation	WP020 00
Aircraft Corrosion Control	A1-F18AC-SRM-500
Inner and Outer Wing Finish System and Markings	WP027 00
Integrated Flight Controls	A1-F18AC-570-300
Wing Fold Transmission (17AAU501 or 17AAV502)	WP060 00
Structure Illustrated Parts Breakdown-Wing	A1-F18AC-SRM-410
Wing, Aircraft, Assembly of	FIG004 00
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Weapon Control System	A1-F18C-740-300
Guided Missile Launcher LAU-7/A-5 (61A-Y501) Suspension and Release	
Mechanisms	WP024 00

Alphabetical Index

Subject	Page No.
Description	1
Free Play Inspection	2
Inspection And Repair	3
Wear Tolerances	3

Record of Applicable Technical Directives

None

1. DESCRIPTION.

2. Wear limits for the outer wing allow a maximum free play of 0.100 inch. The paragraphs below contain procedures for free play inspection, wear tolerances, support equipment, and materials required.

3. FREE PLAY INSPECTION. See figure 1.

Support Equipment Required

Nomenclature	Part Number or Type Designation
15x28 Aluminum Tee Assembly	Fabricate
Aluminum Arm Assembly	Fabricate
Dial Indicator Kit (2 Required)	665-441 (Starrett or Equivalent)
Drilled Washer	Fabricate
Spring Resiliency Tester	DPPH150
Tripod Jack, 20 Ton (T20-3FH)	782D1100
Weights, 25 Pound (or Equivalent)	-

Materials Required

Nomenclature	Specification or Part Number
Aircraft Marking Pencil, Black	MIL-P-83953-2, Type 1, Class A
Isopropyl Alcohol	TT-I-735, Grade 1
Rymple Cloth	AMS-3819
Tape, Double-Coated	A-A-180, Type 2, Grade B

a. Fabricate aluminum tee, aluminum arm assembly, and drilled washer. See details D through J.

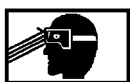
b. Remove Guided Missile Launcher LAU-7/A-5 (61A-Y501) (A1-F18AC-740-300, WP024 00).

(1) Remove missile launcher attach bolts from missile launcher.

c. Install missile launcher attach bolts into outer wing attach holes with drilled washer placed on aft bolt.



Isopropyl Alcohol



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

d. Clean bottom side of aluminum tee assembly and area of inner wing where aluminum tee assembly is to be located with a rymple cloth saturated with solvent. Wipe clean with dry rymple cloth before isopropyl alcohol dries.

e. Position aluminum tee assembly on inner wing and mark area for position with pencil.

f. Apply tape to aluminum tee assembly.

g. Position aluminum tee assembly on inner wing at wing fold hinge with aluminum angle centered over middle hinge point and extending over outer wing.

h. Clamp dial indicators to two small aluminum angles suspended over outer wing.

i. Adjust dial indicators with dial indicator plungers resting on upper surface of outer wing. Adjust dial indicators to 0.



To prevent damage to aircraft make sure that there is enough clearance between jack and outer wing before moving jack under outer wing, and do not raise jack higher than required to locate arm in horizontal position.

j. Position jack and arm under outer wing, raise jack until rubber pad on arm contacts outer wing and arm is horizontal. Mark location of rubber pad with pencil. Seat jack by placing blocks under jack foot pads.

NOTE

Any combination of weights may be used to get total of required down load on outer wing. Some weight may be hung from forward missile launch attach bolt.

k. Hang spring resiliency tester from drilled washer on aft missile launcher attach bolt and pull down with a 75 pound down load.

l. Readjust bolt dial indicators to 0 with load applied.

m. Attach spring resiliency tester to arm and pull arm down with a 50 pound load.

n. Determine total deflection by subtracting dial indicator readings from each other.

o. Total deflection should not exceed 0.100 inch. A total deflection that exceeds 0.100 inch requires inspection and repair, paragraph 4.

p. Remove dial indicators from aluminum angles.

q. Lower jack and arm, remove arm and blocks, and move jack out from under aircraft.

r. Remove aluminum tee assembly from upper wing surface.

s. Refinish surface (A1-F18AC-SRM-500, WP027 00).

4. INSPECTION AND REPAIR. See figure 2. If the outer wing has failed the freeplay inspection, the joints should be inspected and corrected as detailed below.

a. Remove outer wing (WP020 00). Do not press out bushings or remove force mated bushings.

b. Remove wingfold transmission (A1-F18AC-570-300, WP060 00). Do not press out or remove force mated bushings.

c. Disassemble rod end bearing view D. For breakdown, (A1-F18AC-SRM-410, Figure 004 00).

d. Visually inspect for any broken or yielded components. Measure all replaceable and repairable parts (rods, bushings, bolts, pin assemblies) and compare to allowable wear tolerances.

e. Replace all replaceable items if they exceed wear tolerances. Repair rods, if tolerance is exceeded (WP012 00), reassemble swivel joints and repeat freeplay inspection.

f. If second freeplay inspection fails, depot engineering disposition is required.

5. WEAR TOLERANCES. See figure 2. Clearances that exceed those in figure require depot engineering disposition unless other specific information is given.

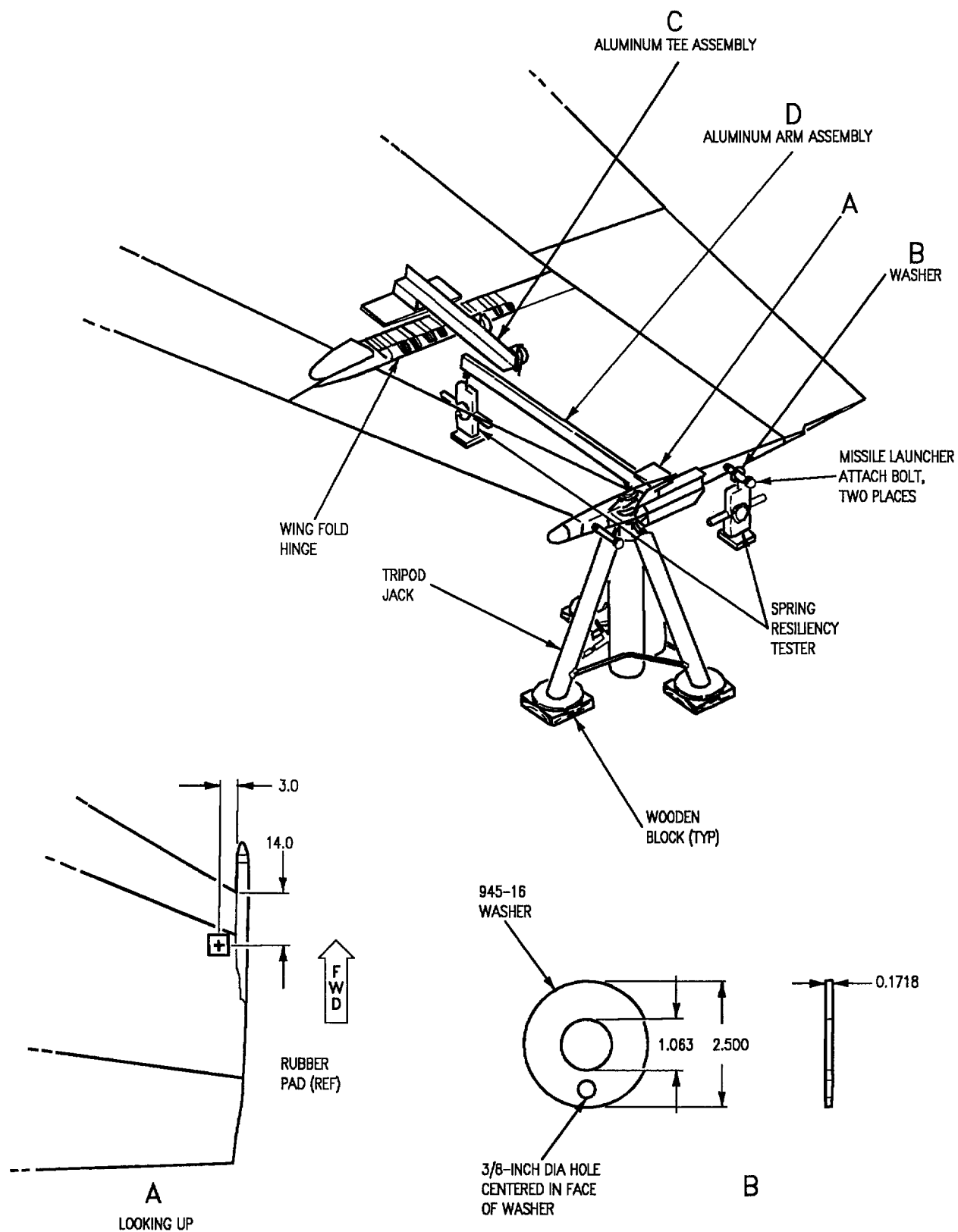
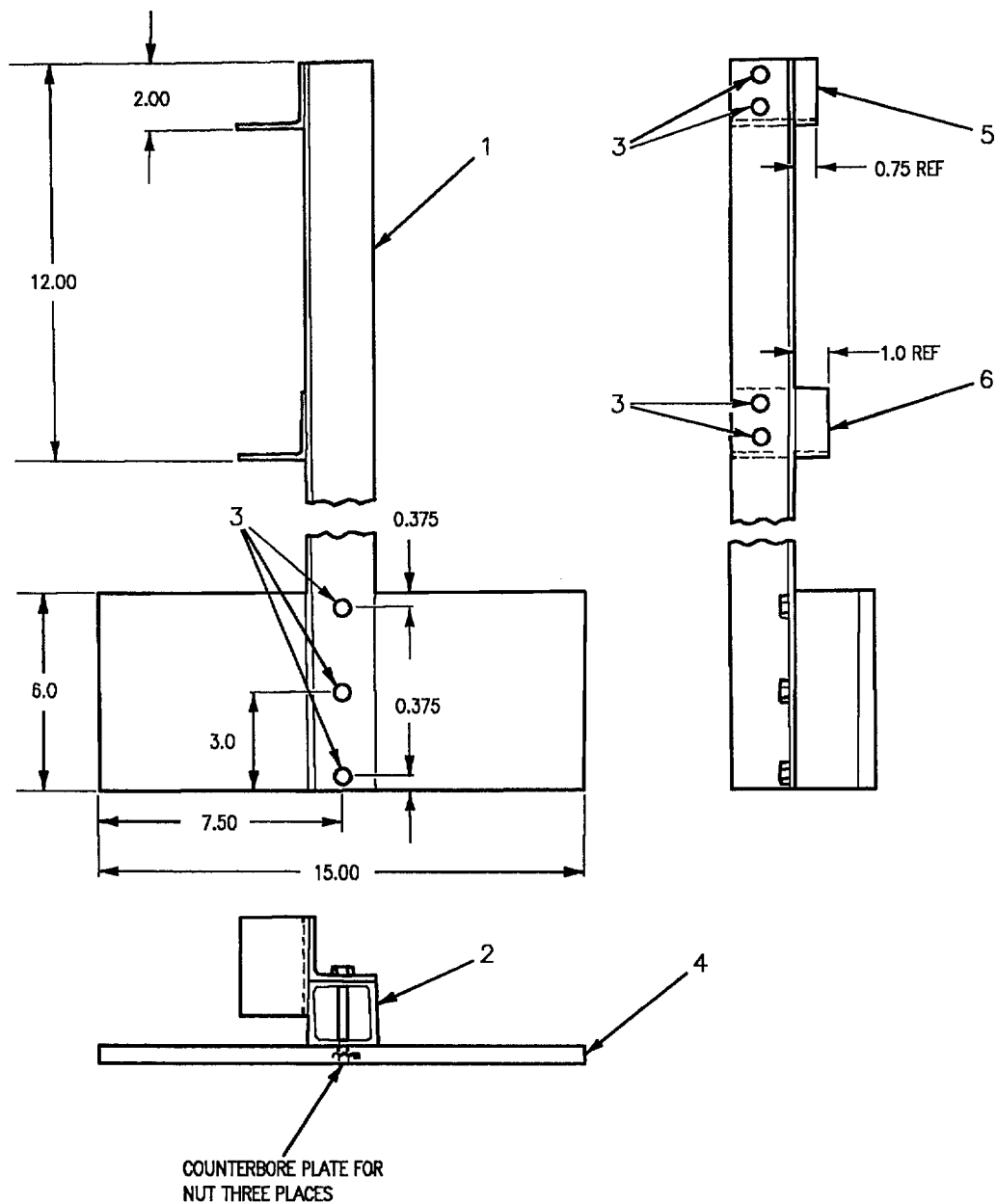


Figure 1. Free Play Inspection (Sheet 1)



C

Figure 1. Free Play Inspection (Sheet 2)

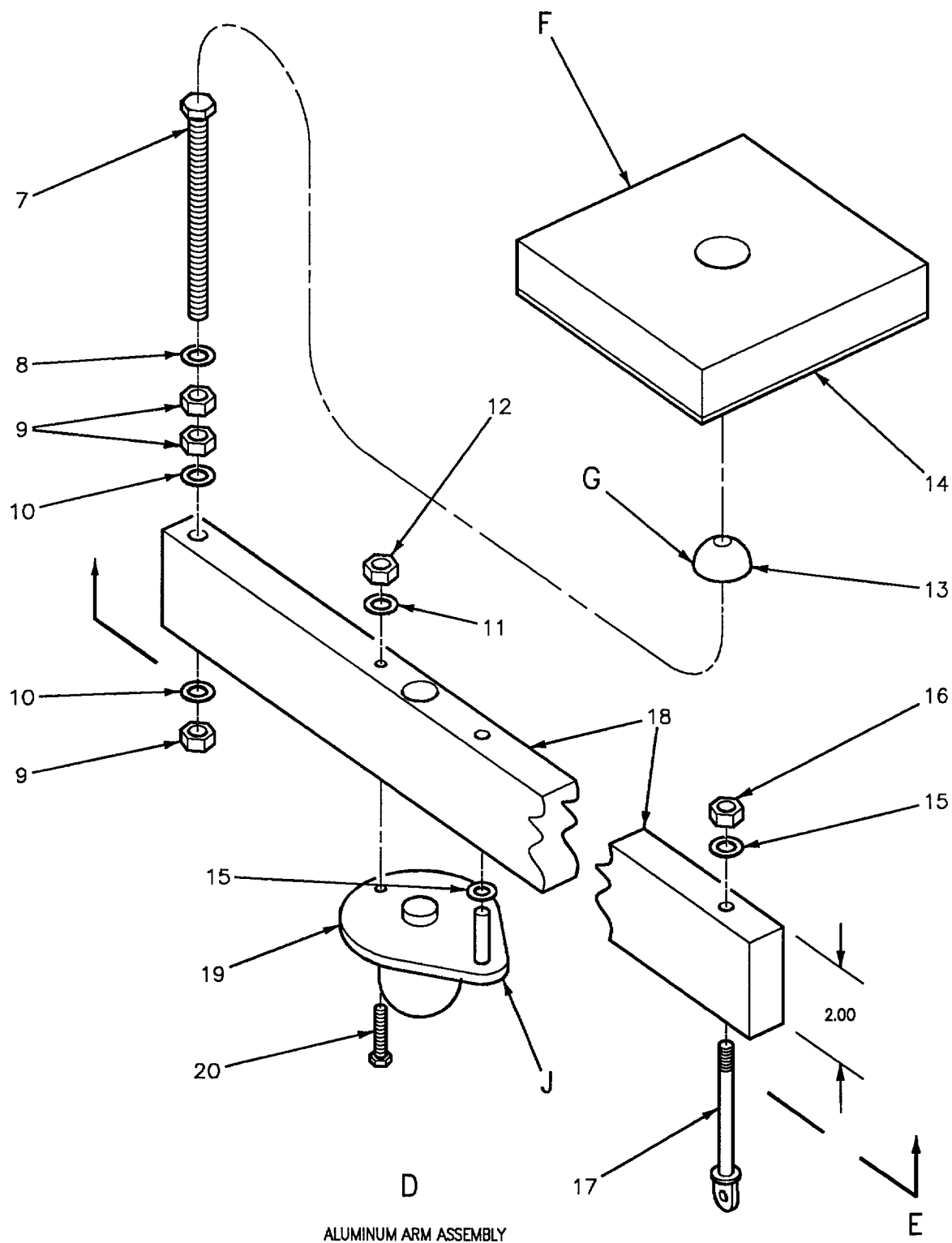


Figure 1. Free Play Inspection (Sheet 3)

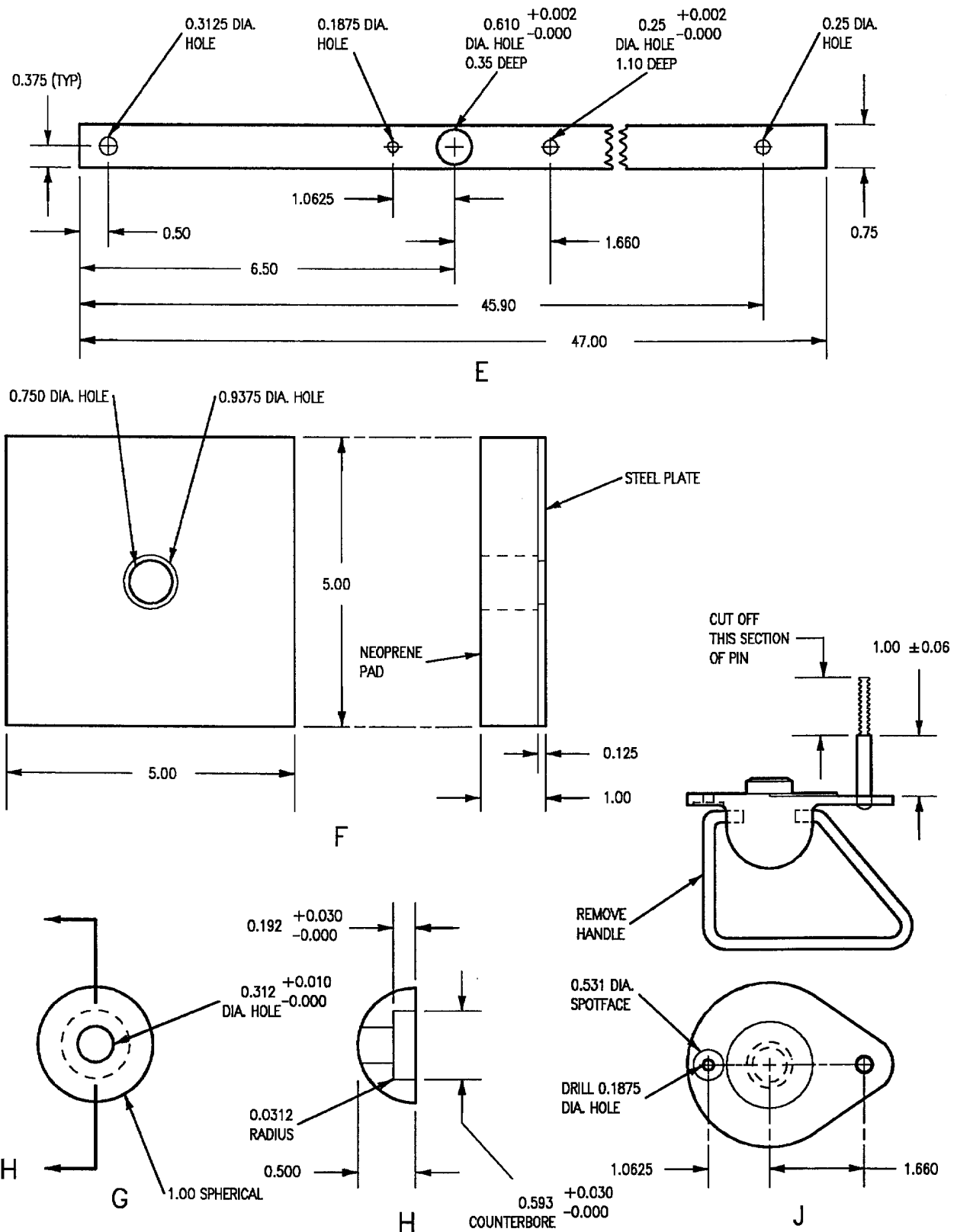







Figure 1. Free Play Inspection (Sheet 4)

INDEX NO.	PART NAME	SPECIFICATION OR PART NO.
1	ALUMINUM ANGLE, 1/8-INCH THICK	2X2X28
2	ALUMINUM EXTRUSION, SQUARE	2X2X6
3	BOLT NUT	AN3-  AN315-3
4	ALUMINUM PLATE	1/2X6X15
5	ALUMINUM ANGLE, 1/8-INCH THICK	2X2X2 3/4
6	ALUMINUM ANGLE, 1/8-INCH THICK	2X2X3
7	BOLT, HEX HEAD	NAS428-5-42
8	WASHER, FLAT	AN970-5
9	NUT	AN315-5
10	WASHER, FLAT	AN960JD516
11	WASHER, FLAT	AN960JD10
12	NUT	NAS1291-C3M
13	SWIVEL BALL	
14	TENSION PAD	
15	WASHER, FLAT	AN960JD416
16	NUT	NAS1291-C4M
17	EYE BOLT	AN43B-25A
18	ARM	
19	JACK PAD	 53E010004-1
20	BOLT, HEX HEAD	NAS1801-3-16






LEGEND	
	FABRICATE FROM MMS-202 STEEL ROD.
	FABRICATE NEOPRENE PAD FROM MIL-R-6130, TYPE 2, GRADE A, CONDITION FIRM; FABRICATE STEEL PLATE FROM QQ-S-633, COMP. 1018, COND. NORMALIZED; BOND NEOPRENE PAD TO STEEL PLATE USING MIL-S-83430; FOR SEALANT PREPARATION AND APPLICATION (A1-F18AC-SRM-200, WPO11 00).
	FABRICATE FROM 6061-T6511, QQ-A-200/8 ALUMINUM ALLOY, 47.00 X 0.75 X 2.00 BAR STOCK.
	NSN 1730-00-963-5987, F-4 WING/FUSELAGE JACK PAD.
	LENGTH DETERMINED ON INSTALLATION.

Figure 1. Free Play Inspection (Sheet 5)

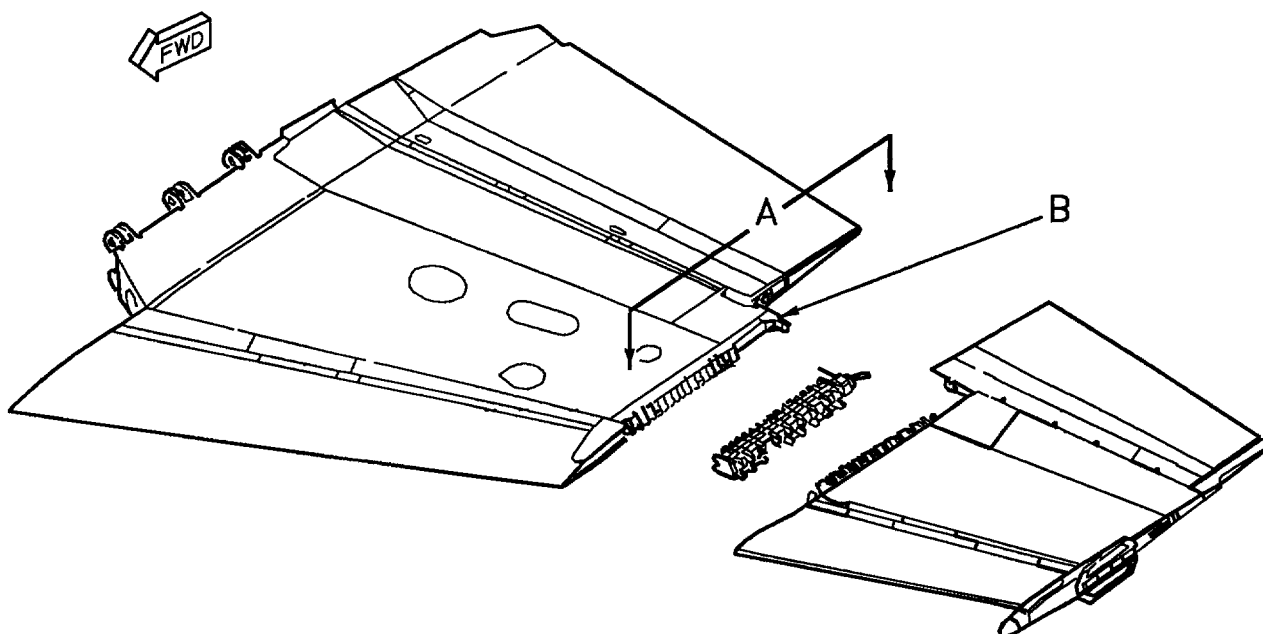


Figure 2. Wear Tolerances (Sheet 1)

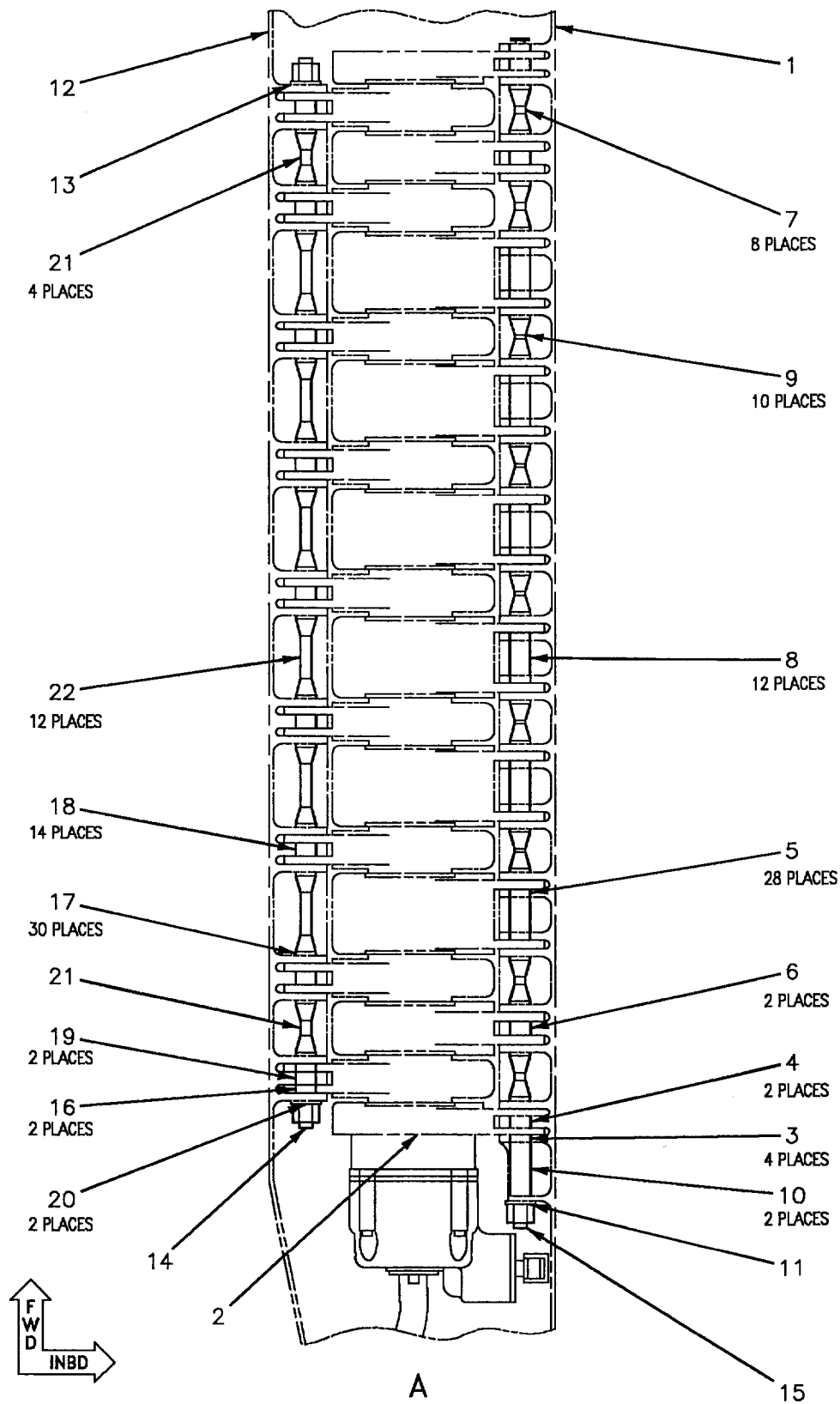
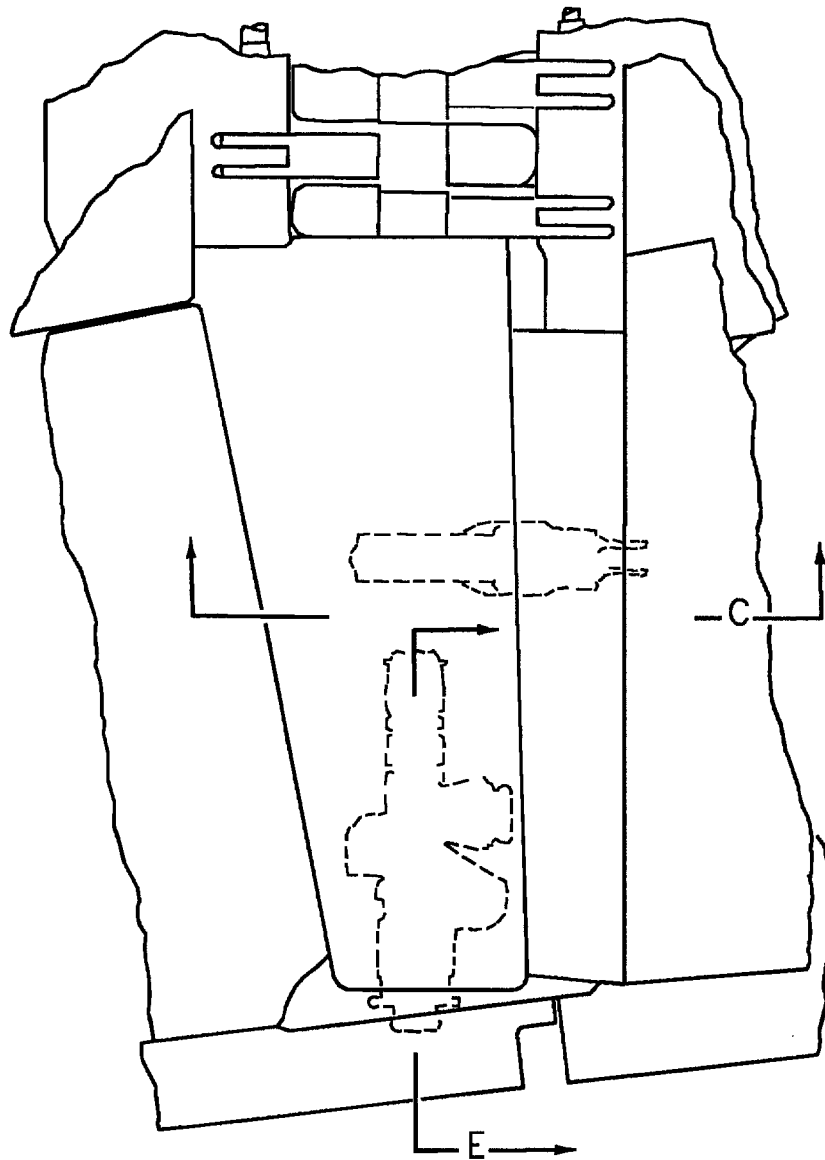


Figure 2. Wear Tolerances (Sheet 2)



B

Figure 2. Wear Tolerances (Sheet 3)

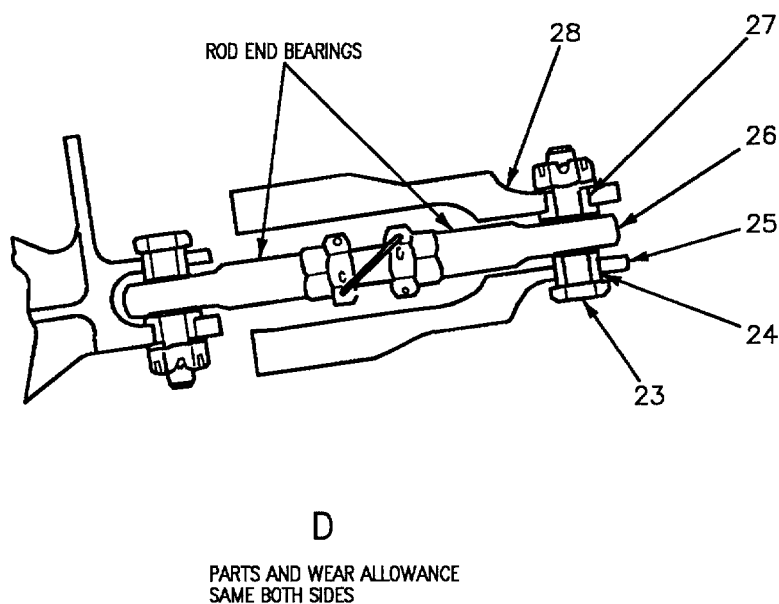
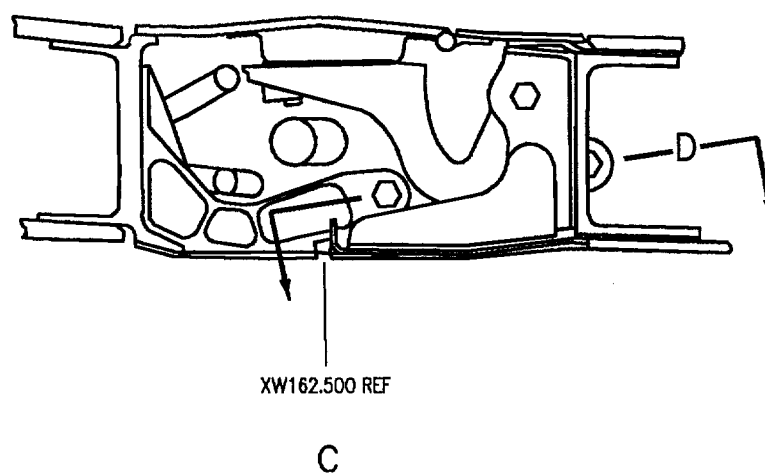


Figure 2. Wear Tolerances (Sheet 4)

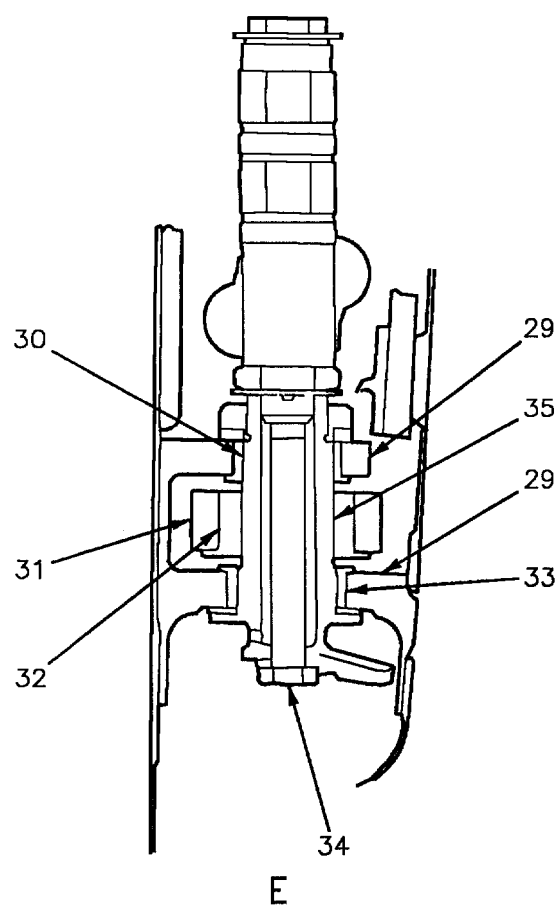


Figure 2. Wear Tolerances (Sheet 5)







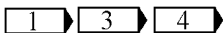
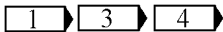
Det	Idx No.	Part Number	Part Name	In Service Tolerance	
				Manufacturing Tolerance	Wear Tolerance
A	1	74A110611	Inner Wing Rib	0.5740+0.0022/-0.0000	
	2	2022308	Trans-mission	0.4535+0.0005/-0.0000	0.4535+0.0010/-0.0000
	3	ST4M219-07013	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	4	ST4M219-07010	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	5	ST4M219- 07055	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	6	ST4M219-07012	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	7	74A150762-2005	Spacer	0.460+0.010/-0.010	
	8	74A150762-2001	Spacer	0.460+0.010/-0.010	
	9	74A150762-2003	Spacer	0.460+0.010/-0.010	
	10	74A150762-2011	Spacer	0.460+0.010/-0.010	
	11	74A670680	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	12	74A150613	Outer Wing Rib	0.5740+0.0022/-0.0000	
	13	74A150743-2003	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	14	74A670669-2021	Rod	0.4525+0.0000/-0.0007	
	15	74A670669-2017	Rod	0.4525+0.0000/-0.0007	
	16	ST4M219-07014	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	17	ST4M219-07013	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	18	ST4M219-07015	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	19	ST4M219-07054	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000

Figure 2. Wear Tolerances (Sheet 6)


























Det	Idx No.	Part Number	Part Name	In Service Tolerance	
				Manufacturing Tolerance	Wear Tolerance
	20	 74A150743-2003	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
		 74A150743-2005	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
		 4M279-07014	Bushing	0.4535+0.0007/-0.0000	0.4535+0.0014/-0.0000
	21	74A150762-2013	Spacer	0.460+0.010/-0.010	
	22	74A150762-2015	Spacer	0.460+0.010/-0.010	
D	23	NAS6303U11D	Bolt	0.1895+0.0000/-0.0005	 
	24	ST4M166-3-003	Bushing	ID 0.1900+0.0010/-0.0000 OD 0.3115+0.0000/-0.0005	0.1900+0.0020/-0.0000  0.3115+0.0000/-0.0008 
	25	74A150708	Arm Assembly	0.3121+0.0005/-0.0001	0.3121+0.0010/-0.0001
	26	ST4M208-3	Bearing	0.1900+0.0000/-0.0005	0.1900+0.0010/-0.0005 
	27	NAS77A3-12P	Bushing	ID 0.1900+0.0015/-0.0000 OD 0.3136+0.0000/-0.0005	0.1900+0.0020/-0.0000 
	28	74A150708	Arm Assembly	0.3125+0.0005/-0.0000	
E	29	 74A150810 	Spar, Outer Wing	1.3125+0.0010/-0.0005 1.3125+0.0010/-0.0005 1.1875+0.0010/-0.0005	 1.3125+0.0030/-0.0005 
	30	ST4M139BC16	Bushing	ID 1.0000+0.0012/-0.0000 OD 1.1908+0.000/-0.001	1.0000 +0.0014/-0.0000 
	31	 74A110952 	Spar, Inner Wing	1.3766+0.0010/-0.0000 1.3766+0.0010/-0.0000	 1.3766+0.0015/-0.0005
	32	 74A110935 	Bushing	OD 1.3800+0.0000/-0.0010 OD 1.3761+0.0000/-0.0015	  

Figure 2. Wear Tolerances (Sheet 7)

Det	Idx No.	Part Number	Part Name	In Service Tolerance	
				Manufacturing Tolerance	Wear Tolerance
	33	<div><div>8</div></div> 4M139BC18-36	Bushing	ID 1.125+0.0012/-0.0000 OD 1.3158+0.000/-0.001	1.125+0.0014/-0.0000 <div><div>1</div></div>
		<div><div>9</div></div> ST4M130-18001	Bushing	ID 1.125+0.0012/-0.0000 OD 1.310+0.000/-0.001	1.125+0.0014/-0.0000 <div><div>4</div></div> 1.310+0.000/-0.004 <div><div>4</div></div>
	34	NAS677440H	Bolt <div><div>12</div></div>	0.4365+0.0005/-0.0000	<div><div>1</div></div> <div><div>4</div></div>
		NAS676V40H	Bolt <div><div>13</div></div>	0.3740+0.0005/-0.0000	<div><div>1</div></div> <div><div>4</div></div>
	35	<div><div>12</div></div> <div><div>13</div></div> 74A150715	Pin Assembly	0.4480+0.0020/-0.0000 0.3860+0.0020/-0.0000 1.1242+0.0000/-0.0008 0.9992+0.0000/-0.0008	0.4480+0.0040/-0.0000 0.3860+0.0040/-0.0000 <div><div>1</div></div> <div><div>4</div></div> <div><div>1</div></div> <div><div>4</div></div>

LEGEND

1

 None allowed.

2

 Bonded joint, wear tolerance not applicable.

3

 If cadmium plating is worn, repair (WP012 00).

4

 Replace when tolerance exceeded.

5

 161353 THRU 161733, 161735 THRU 161736, 161746.

6

 161734, 161737 THRU 161745, 161747 THRU 162444.

7

 162445 AND UP.

8

 161353 THRU 161965.

9

 161966 AND UP.

10

 161353 THRU 161987.

11

 162394 AND UP.

12

 Left side.

13

 Right side.

Figure 2. Wear Tolerances (Sheet 8)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

OUTER WING REMOVAL WITH DAMAGED WING FOLD TRANSMISSION

Reference Material

Structure Repair - Wing	A1-F18AC-SRM-210
Outer Wing Removal and Installation	WP020 00
Integrated Flight Controls	A1-F18AC-570-300
Aileron (84MPU525 or 84MPV526) or Aileron (84MPU527 or 84MPV528)	WP010 00
Inboard Flap (84MPU535 or 84MPV536)	WP028 00
Inner Wing Outboard Flap Mechanism	WP031 00
Wing Fold Swivel Joint (17U-U503 or 17U-V504)	WP059 00
Wing Fold Transmission (17AAU501 or 17AAV502)	WP060 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Line Maintenance Procedures	A1-F18AC-LMM-000
Plane Captain Manual	A1-F18AC-PCM-000
Weapon Control Systems	A1-F18C-740-300
Guided Missile Launcher LAU-7/A-5	WP024 00

Alphabetical Index

Subject	Page No.
Removal (With Damaged Wing Fold Transmission)	2

Record of Applicable Technical Directives

None

Support Equipment Required

Nomenclature	Part Number or Type Designation
Aircraft Maintenance Platform	B-1 (or Equivalent)
Adapter Set, Pin Removal/Insertion	74D110043
External Electrical Power Source	-

Support Equipment Required
(Continued)

Nomenclature	Part Number or Type Designation
External Hydraulic Power Source	-
Flap Control Surface Lock	74D750005
Outer Wing Sling	74D110030
Pin Set, Outer Wing/Leading Edge Flaps Installation/Removal	74D110060

Materials Required

Nomenclature	Specification or Part Number
Tape, Pressure Sensitive	855-1.000 IN.

1. REMOVAL (WITH DAMAGED WING FOLD TRANSMISSION).

2. These procedures are for the left outer wing. Procedures for right outer wing are identical except as indicated.

a. Make sure safety devices required for ground operation are installed (A1-F18AC-PCM-000).

b. Lower outboard leading edge flap per substeps below:

(1) On LH vertical control panel, set FLAP switch to AUTO.

(2) On No. 5 circuit breaker panel assembly open the circuit breakers below:

(a) 12CBD071 RMG RLY CONT.

(b) On 161353 THRU 161360, 12CBD028 LDG GR CONT UNIT.

(c) On 161361 AND UP, 12CBD028 NG RLY CONT.

(d) 12CBD070 LMG RLY CONT.



Apply 2850 psi minimum pressure to aircraft to prevent damage to hydraulic drive unit.

(3) Apply external hydraulic power to hydraulic systems 1 and 2 (A1-F18AC-LMM-000).

(4) Apply external electrical power (A1-F18AC-LMM-000).

(5) Set 4 switch to B ON.

(6) Set RESET switch.

(7) On MAP GAIN control panel assembly, set SPIN switch to RCVY.

(8) Turn off hydraulic power (A1-F18AC-LMM-000).

(9) Turn off electrical power (A1-F18AC-LMM-000).

(10) On No. 5 circuit breaker panel assembly close the circuit breakers below:

(a) 12CBD071 RMG RLY CONT.

(b) On 161353 THRU 161360, 12CBD028 LDG GR CONT UNIT.

(c) On 161361 THRU 161519, 12CBD028 NG RLY CONT.

(d) 12CBD070 LMG RLY CONT.

c. Remove door 190L (or 190R) (A1-F18AC-LMM-010).

d. Remove guided missile launcher LAU-7/A-5 (A1-F18AC-740-300, WP024 00).

e. Apply external electrical power (A1-F18AC-LMM-000).

f. Apply external hydraulic power to systems 1 and 2 (A1-F18AC-LMM-000).



Make sure wire bundle to guided missile launcher, LAU-7/A-5 is clear of outboard flap as damage to wire bundle could result.

g. Raise outboard leading edge flap and trailing edge flap, do substeps below:

(1) Set 4 switch to B ON.

(2) Set RESET switch.

(3) Set SPIN switch to NORM.

h. Remove hydraulic and electrical power from aircraft (A1-F18AC-LMM-000).

i. Install flap control surface aircraft ground safety lock (A1-F18AC-PCM-000).

j. Remove doors 91L (or 91R), 93L (or 93R), 95L (or 95R), 142L (or 142R), 152L (or 152R), 153L (or 153R), 154L (or 154R), 156L (or 156R), 181L (or 181R), 182L (or 182R), 183L (or 183R), 185L (or 185R), 187L (or 187R), 188L (or 188R), and 189L (or 189R), (A1-F18AC-LMM-010).

k. If existing outer wing is to be reinstalled, go to step aa. If outer wing is to be replaced, continue with next step.

l. Remove bolt (25, figure 1) and washer, securing support (26) to outer wing.

m. Remove bolt (24) and washer, securing support (23) to outer wing.

n. Remove bolt (14) and attaching hardware, from shaft (13). Remove shaft (13) from leading edge flap transmission (flap transmission).

o. Disconnect connectors (10 and 11) from asymmetry control.

p. Remove bolt (7) and attaching hardware, at flap transmission outboard stabilizing attach point.

q. Remove bolt (12) and attaching hardware, at flap transmission inboard stabilizing attach point.

r. Remove bolt (22) and attaching hardware, securing lead (21) to outboard flap (18) or outer wing (2, figure 3).

s. Remove bolt (17, figure 1) and attaching hardware, securing outboard flap (18) to inboard flap hinge (16).

t. Remove bolt (20) and attaching hardware, securing outboard flap (18) to outboard flap hinge (18).

u. Loosen nuts (6) on outboard end of upper and lower expandable bolts (4).

v. Remove nuts (15) and attaching hardware from inboard end of upper and lower expandable bolts (4).

w. Install protector (3) on outboard end of lower expandable bolt (4) and while supporting and shaking outboard leading edge flap and flap transmission, remove lower expandable bolt (4) in an outboard direction. While removing lower expandable bolt (4), install pin (1).

x. Install pin (2) when lower expandable bolt (4) is removed.

y. Install protector (3) on outboard end of upper expandable bolt (4) and while supporting and shaking outboard leading edge flap and flap transmission, remove upper expandable bolt (4) in an outboard direction.

z. Supporting outboard flap, remove pins (1 and 2) and remove outboard flap and flap transmission from aircraft as one assembly.

aa. Remove door 83L (or 83R) (A1-F18AC-LMM-010).

ab. Remove aileron shroud (A1-F18AC-570-300, WP010 00).

ac. Remove wing fold swivel (A1-F18AC-570-300, WP059 00).

ad. Disconnect connectors (5, 9, 11, and 13, figure 2) and ground (16).

ae. Remove clamps (4, 8, 10, 12, and 14) and attaching hardware.

af. Remove clamps (1 and 2) and attaching hardware.

ag. Pull wire bundle from door 83L (or 83R) area through hole in structure. Leave wire bundle with inner wing.

ah. Remove support (9, figure 3) and attaching hardware, from outer wing.

ai. Remove bolt (8) and attaching hardware, from wing fold coupling drive support (support).

aj. Remove nut (3, figure 2) and attaching hardware from pin (6).

ak. Remove screw (7) and attaching hardware from pin (6).

al. Remove pin (6) by pulling pin aft and clear of the outer wing.

am. Manually raise aileron and engage pin (15).

an. In cockpit, pull wing fold control handle out.

ao. Make sure wing fold aircraft ground safety pin is installed (A1-F18AC-PCM-000).

ap. Secure aft attach point for flipper door up and tape to inner wing.

aq. Position maintenance platform under wing fold transmission.

ar. With minimum of 2 inches of padding between platform and transmission, raise platform until snug against wing fold area.

as. Remove nuts (4, figure 3) and attaching hardware from forward and aft ends of inboard or upper and outboard or lower pins (5).

at. Position hoist and attach sling (1) to outer wing.



Make sure support clears outer wing during operation, or damage could result in the outer wing.

au. Take up slack on hoist.

NOTE

If wing fold pin removal slide hammer assembly (3) cannot be attached to outboard pin (5), remove inboard leading edge flap (A1-F18AC-570-300, WP028 00) and support, 74A670234 (A1-F18AC-570-300, WP031 00).

av. Remove bolt (12) and attaching hardware from wing fold flipper door arm (arm).

aw. Attach wing fold pin removal slide hammer assembly (3) to outboard pin (5). While removing pin (5), install pin (11).

ax. Install pin (6) in forward end of wing fold transmission when pin (5) is removed.

ay. Attach wing fold pin removal extension (3) to inboard pin (5). While removing pin (5), install pin (10).

az. Take up slack on sling (1) until pins (6, 10, and 11) are snug. Remove pins (6, 10, and 11).

ba. Remove outer wing from aircraft.

bb. For replacement of wing fold transmission (A1-F18AC-570-300, WP060 00).

bc. For installation of outer wing (WP020 00).

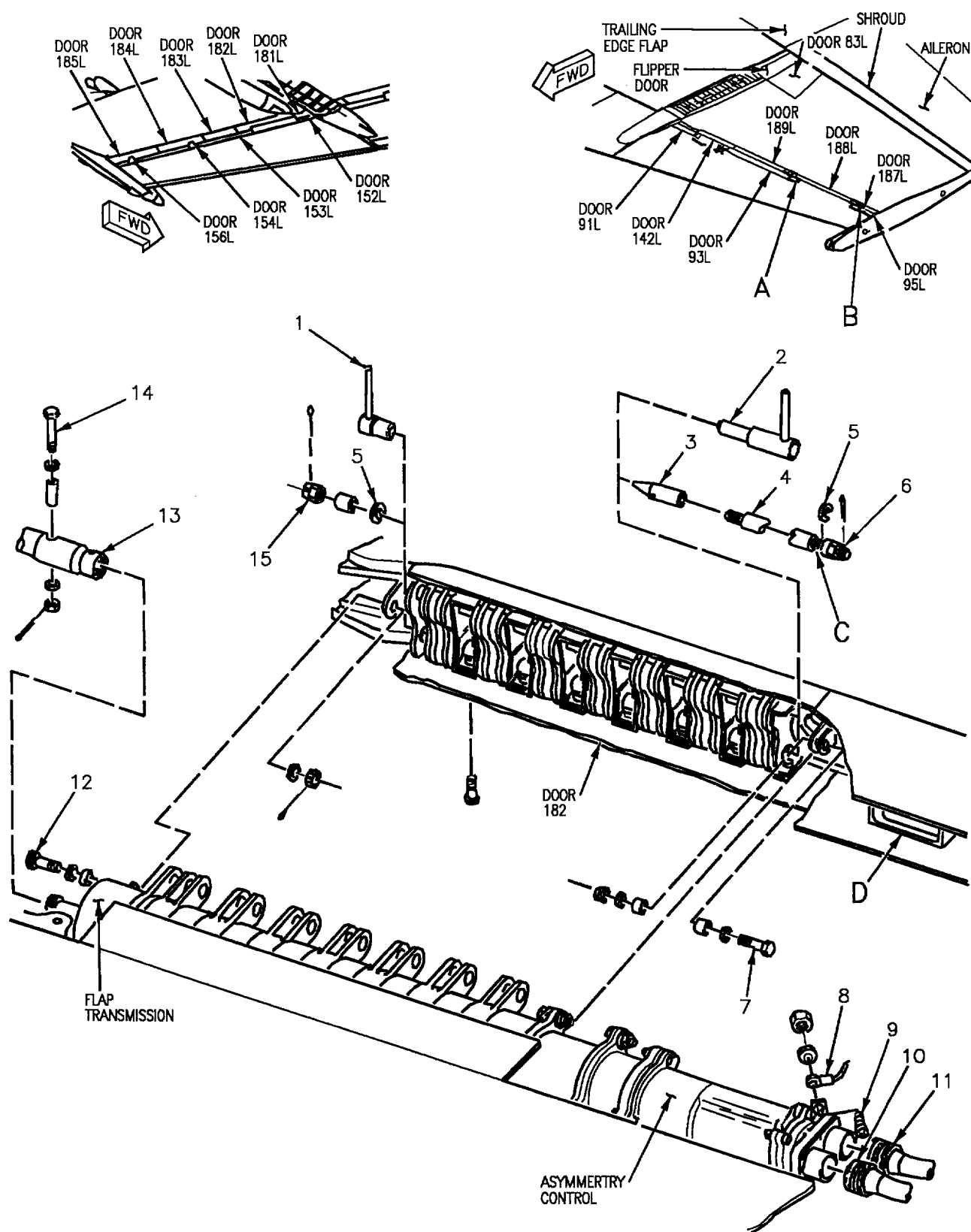


Figure 1. Outer Wing Leading Edge Flap (Sheet 1)

20030101

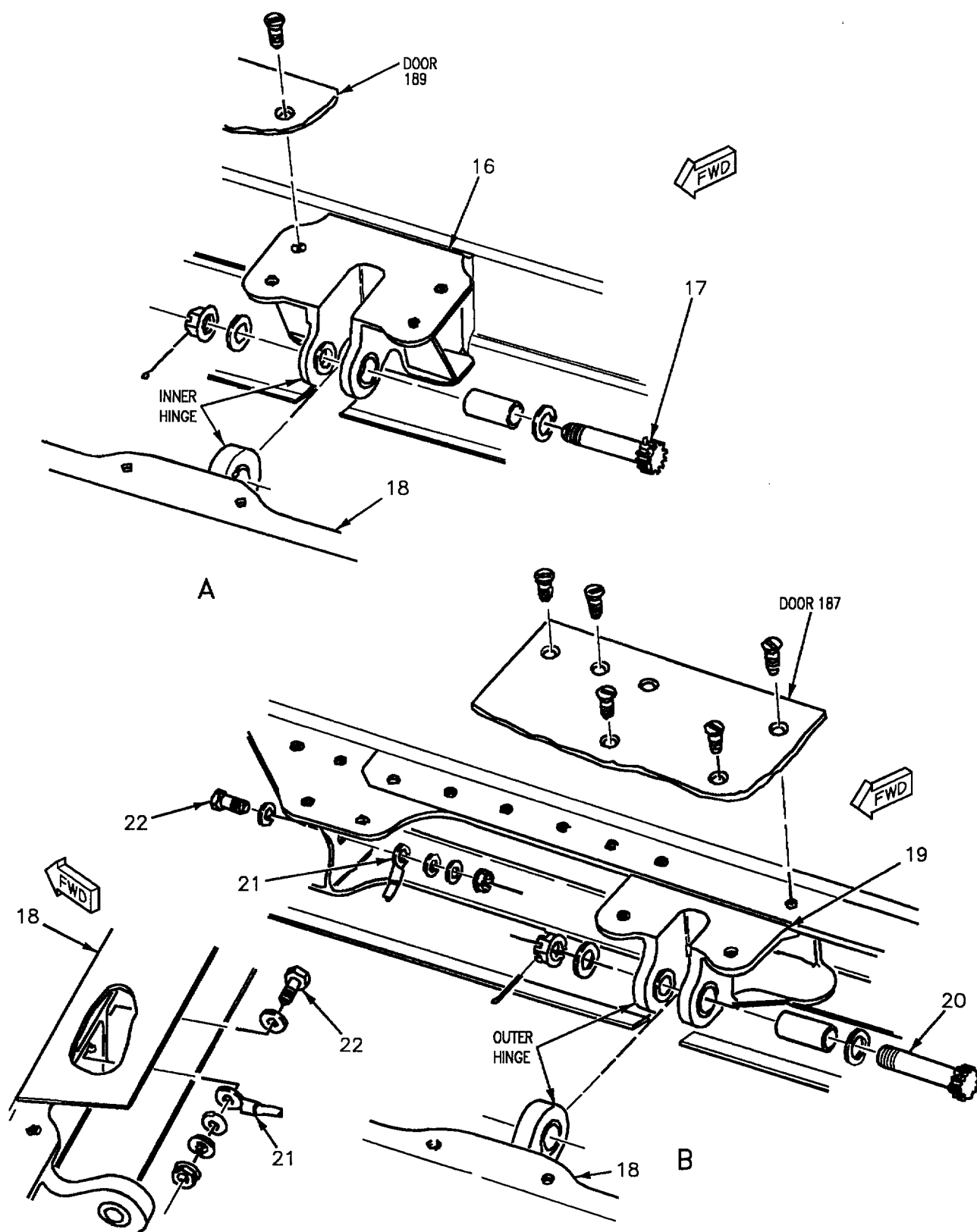


Figure 1. Outer Wing Leading Edge Flap (Sheet 2)

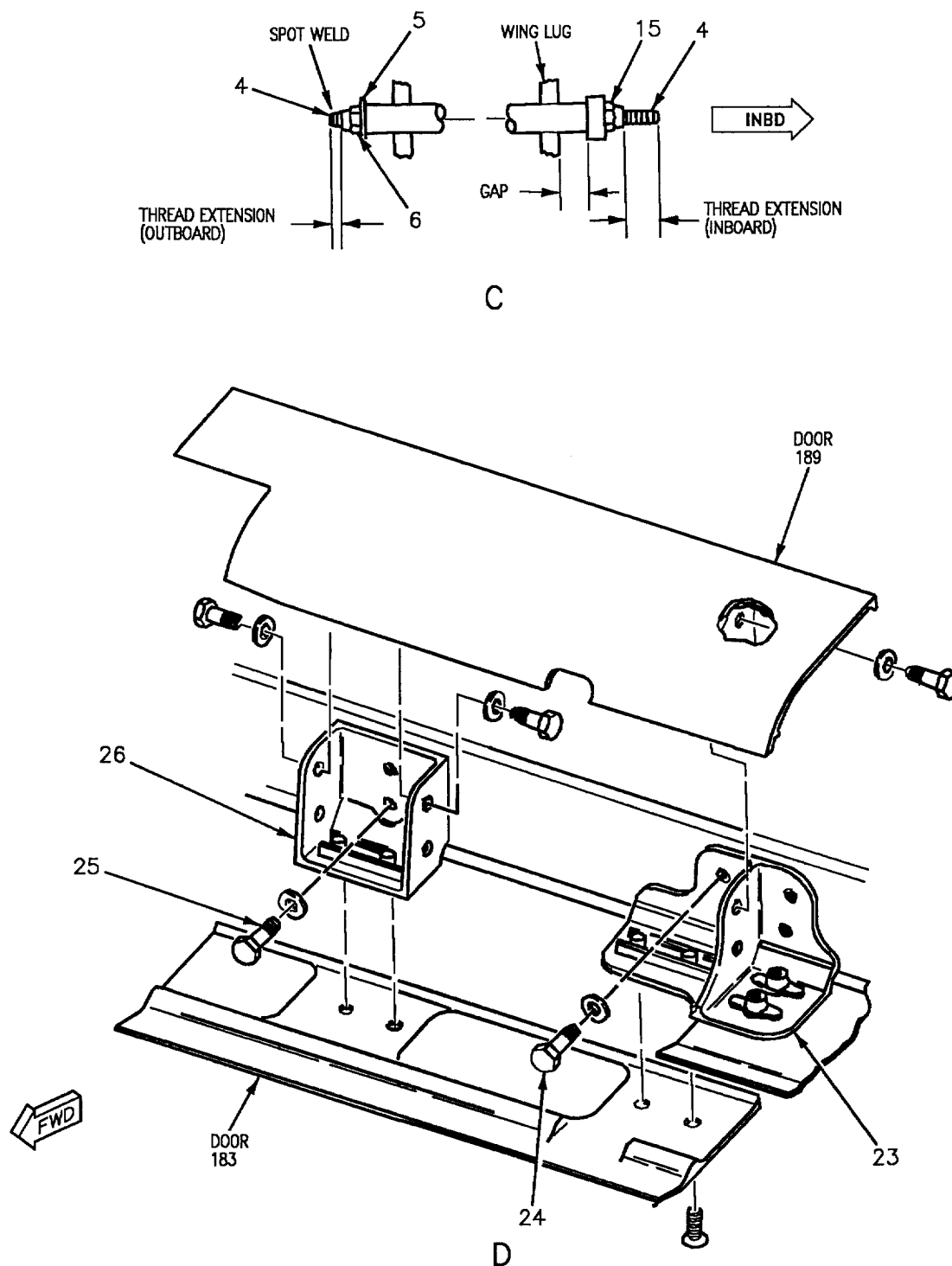


Figure 1. Outer Wing Leading Edge Flap (Sheet 3)

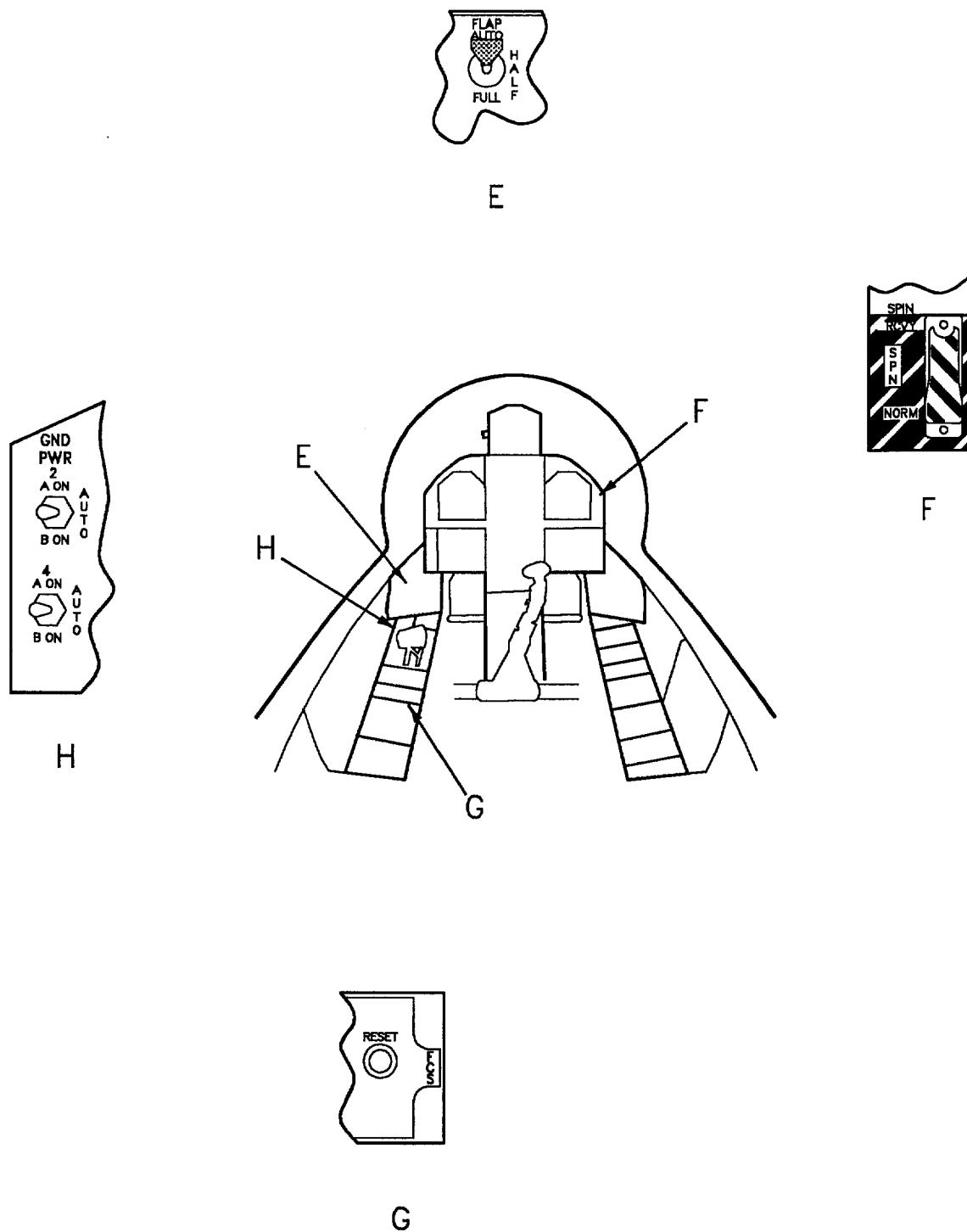


Figure 1. Outer Wing Leading Edge Flap (Sheet 4)

INDEX NO.	NOMENCLATURE
1	PIN ASSEMBLY, (PART OF PIN SET 74D110060-2013)
2	PIN ASSEMBLY, (PART OF PIN SET 74D110060-2015)
3	PROTECTOR, (PART OF PIN SET 74D110043-1003)
4	BOLT EXPANDABLE
5	WASHER SPECIAL
6	NUT
7	BOLT
8	LEAD
9	BOLT
10	CONNECTOR
11	CONNECTOR
12	BOLT
13	SHAFT ASSEMBLY
14	BOLT
15	NUT
16	HINGE HALF
17	BOLT
18	FLAP
19	HINGE HALF
20	BOLT
21	LEAD
22	BOLT
23	SUPPORT
24	BOLT
25	BOLT
26	SUPPORT

Figure 1. Outer Wing Leading Edge Flap (Sheet 5)

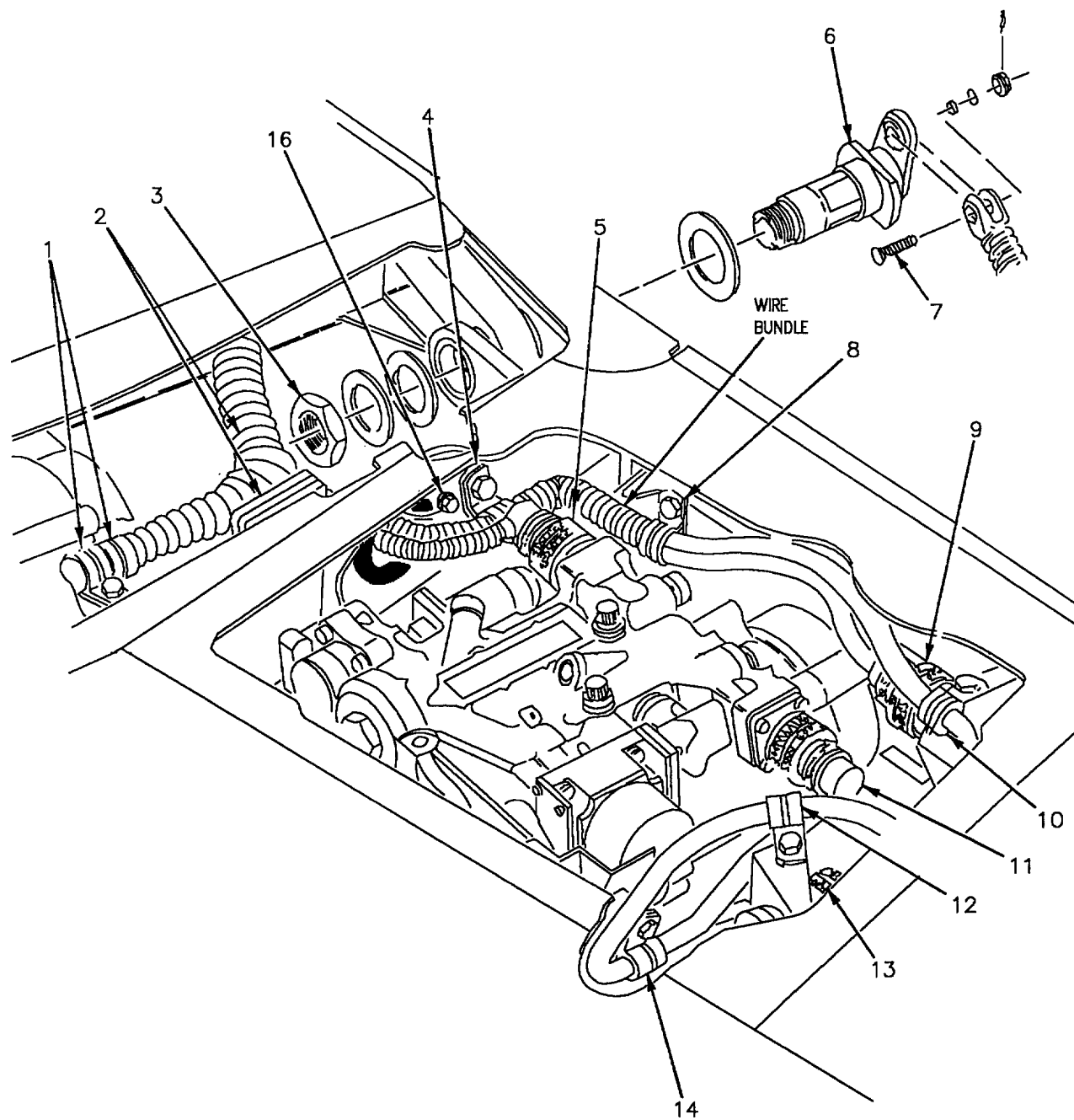
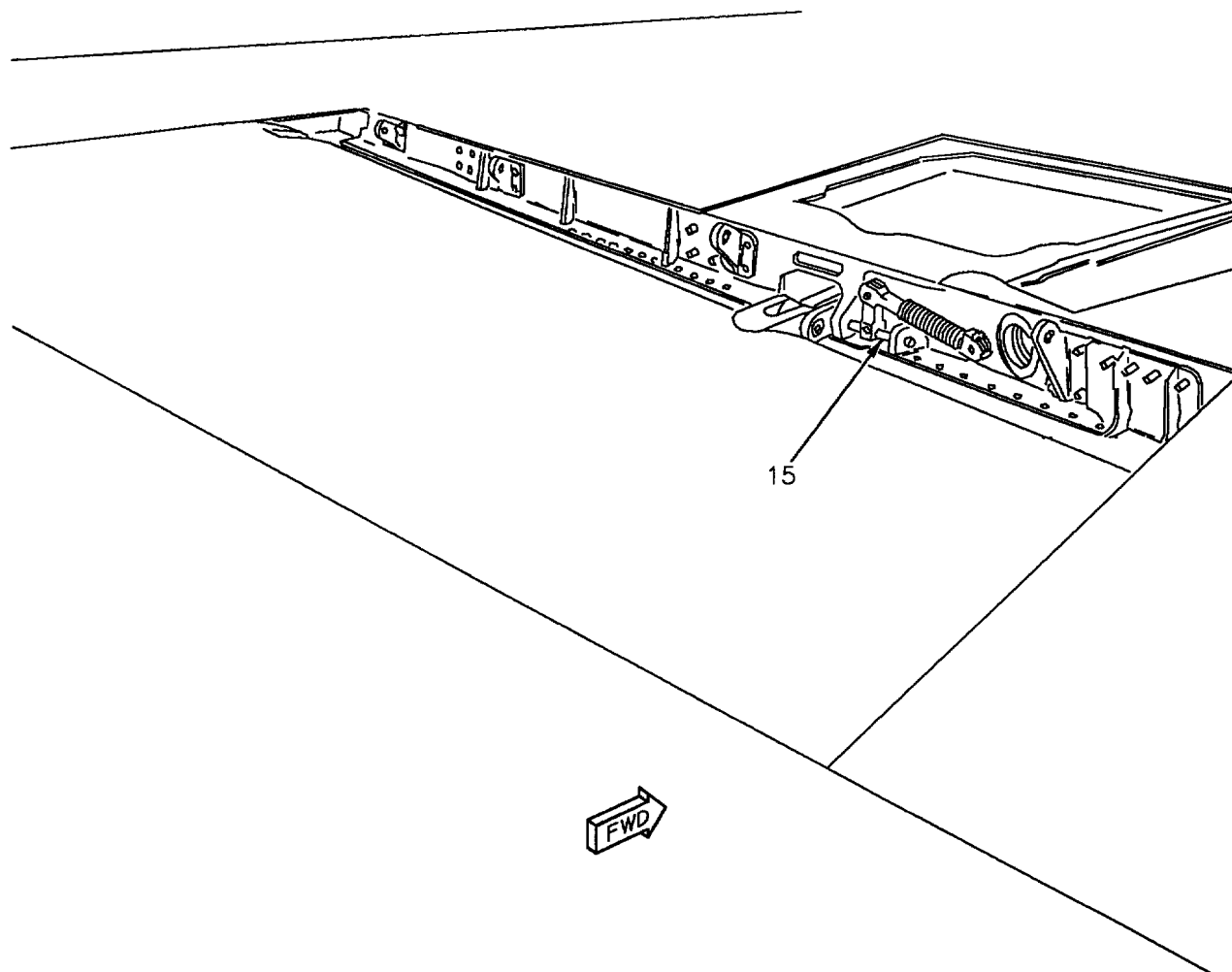
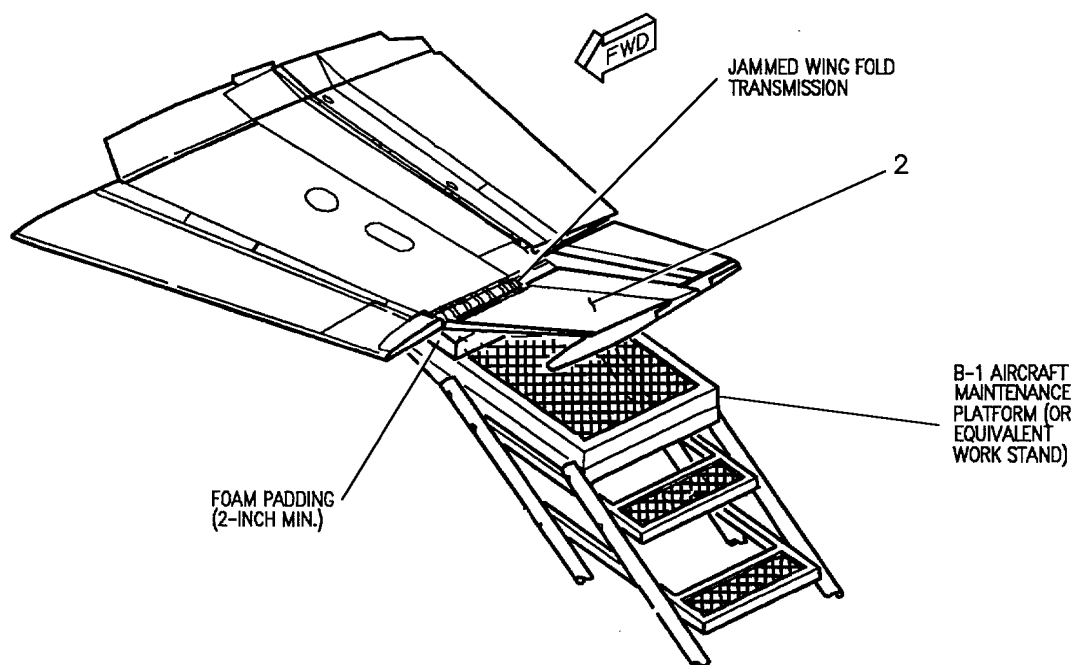


Figure 2. Outer Wing Pin (Sheet 1)



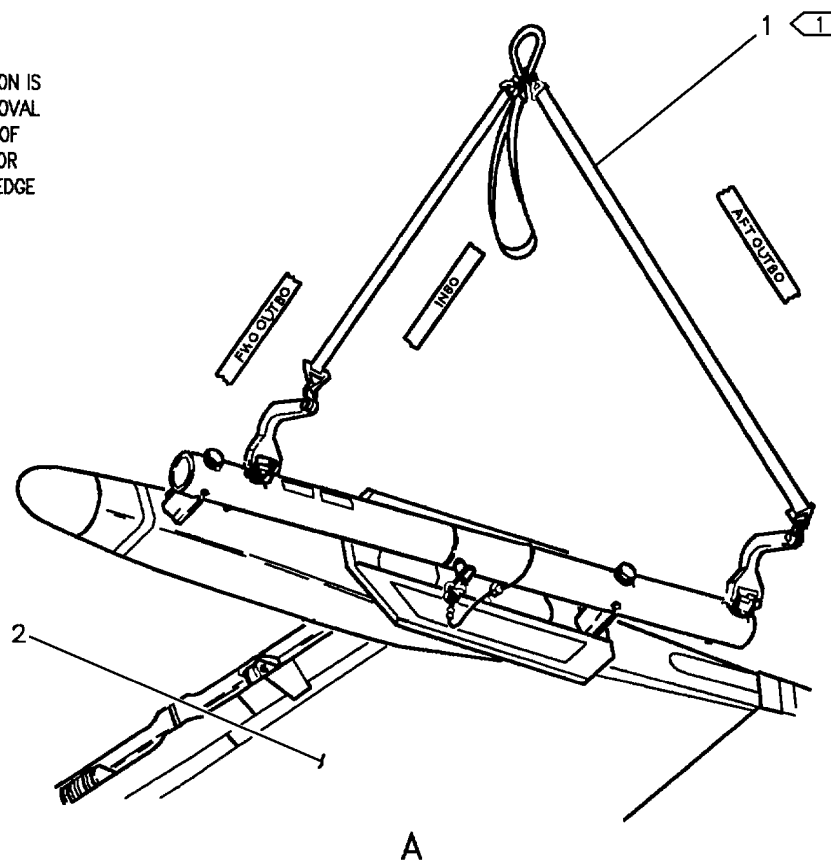
INDEX NO	NOMENCLATURE	INDEX NO	NOMENCLATURE
1	CLAMP	9	CONNECTOR
2	CLAMP	10	CLAMP
3	NUT	11	CONNECTOR
4	CLAMP	12	CLAMP
5	CONNECTOR	13	CONNECTOR
6	PIN	14	CLAMP
7	SCREW	15	PIN
8	CLAMP	16	GROUND

Figure 2. Outer Wing Pin (Sheet 2)



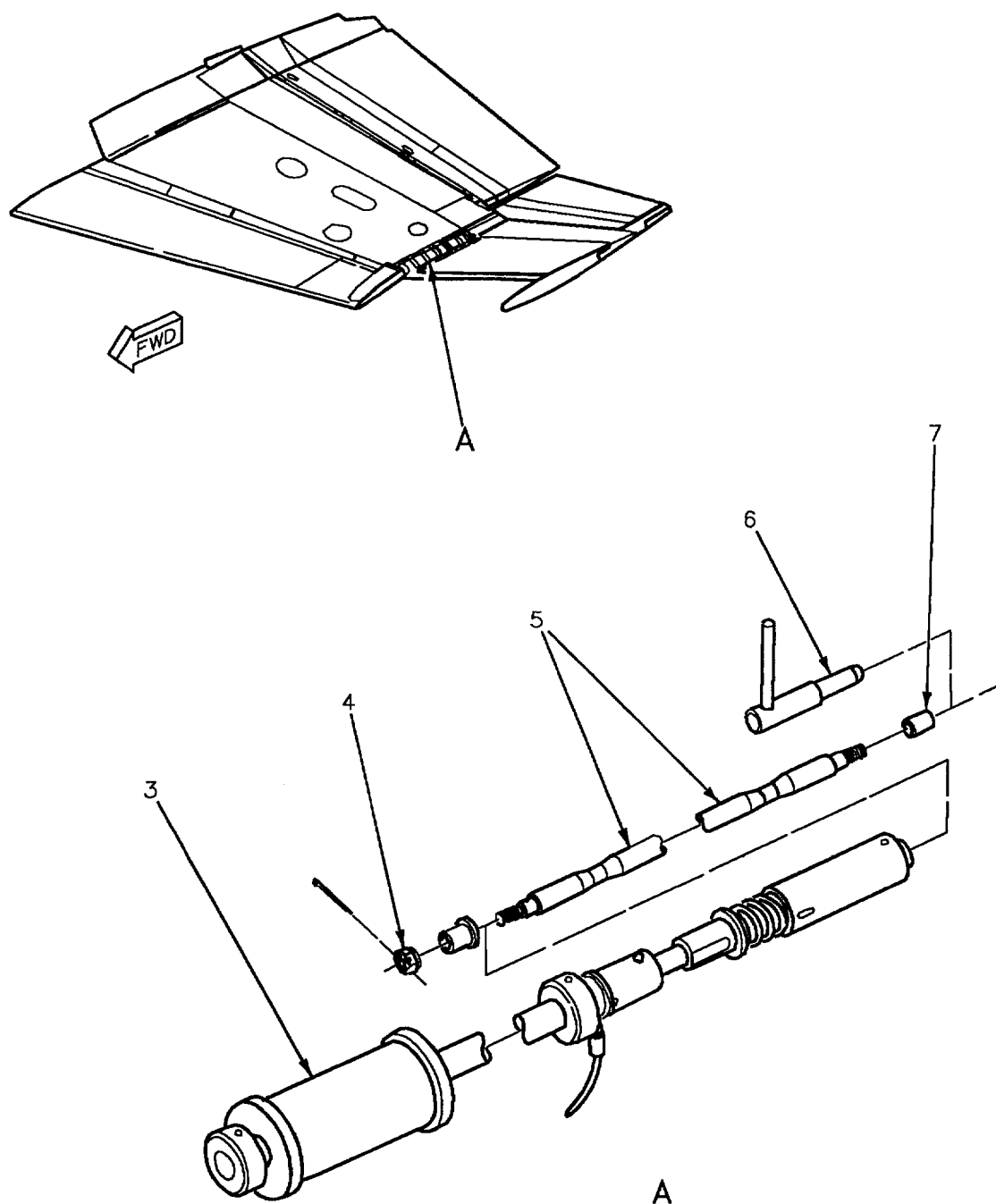
LEGEND

- 1 SLING CONFIGURATION IS THE SAME FOR REMOVAL AND INSTALLATION OF OUTER WING WITH OR WITHOUT LEADING EDGE FLAP INSTALLED



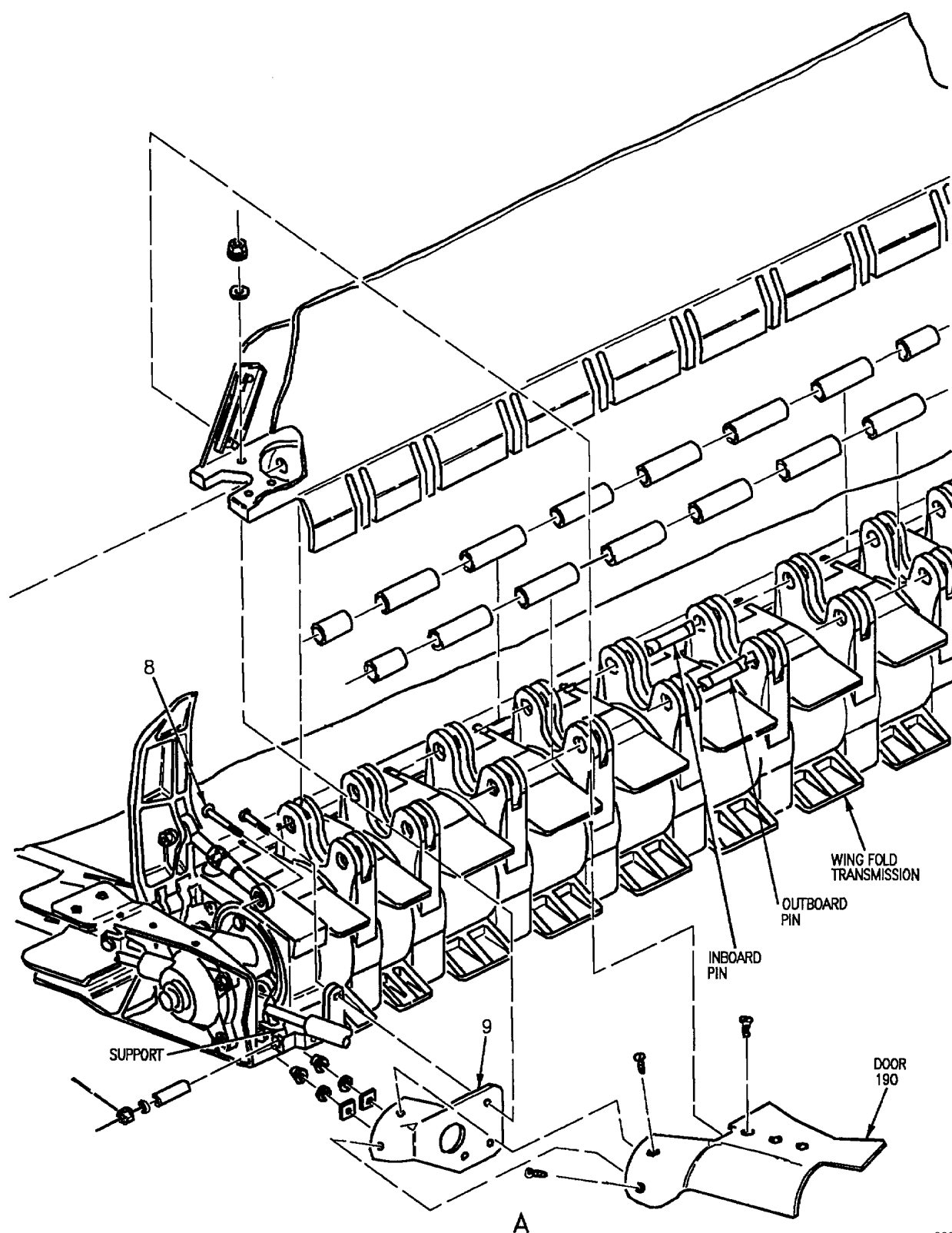
20030301

Figure 3. Removal of Outer Wing with Damaged Wing Fold Transmission (Sheet 1)



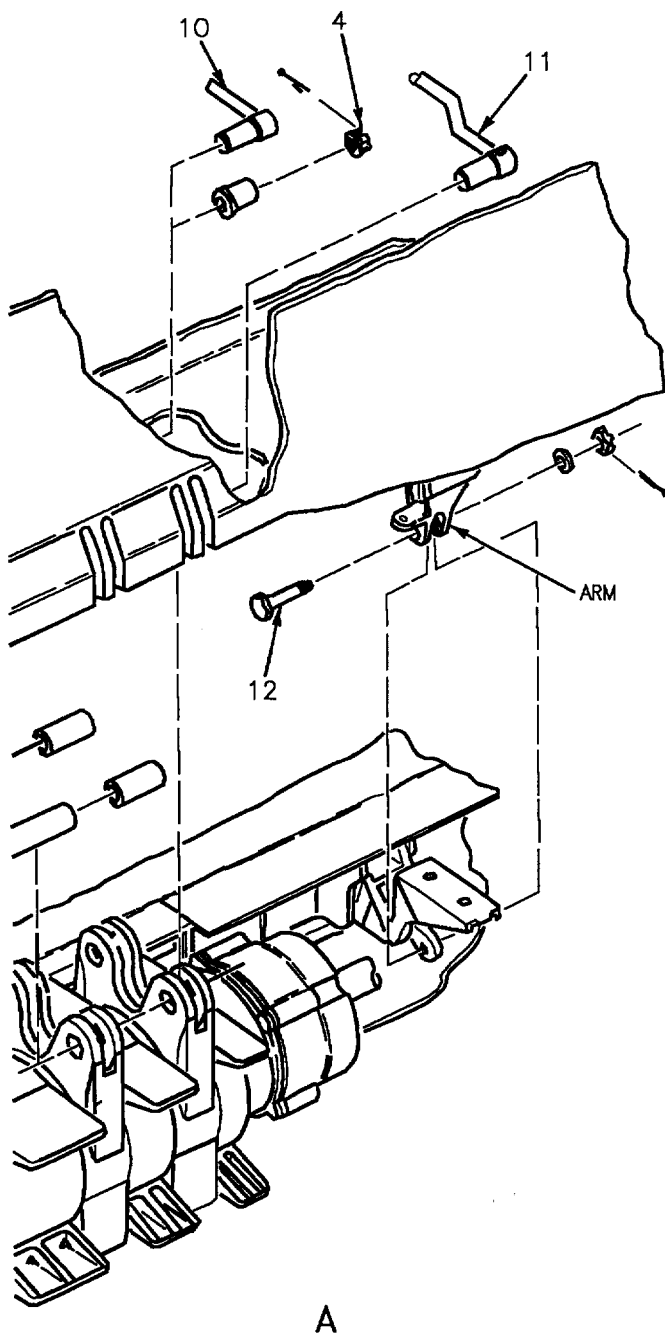
20030302


Figure 3. Removal of Outer Wing with Damaged Wing Fold Transmission (Sheet 2)



20030303

Figure 3. Removal of Outer Wing with Damaged Wing Fold Transmission (Sheet 3)



INDEX NO	NOMENCLATURE
1	SLING  1
2	WING, OUTER
3	SLIDE HAMMER ASSEMBLY, (PART OF ADAPTER SET 74D110043-1003)
4	NUT
5	PIN
6	PIN ASSEMBLY (PART OF PIN SET 74D110060-2001)
7	PROTECTOR (PART OF ADAPTER SET 74D110043- 1003)
8	BOLT
9	SUPPORT
10	PIN ASSEMBLY (PART OF PIN SET 74D110060-2043)
11	PIN ASSEMBLY (PART OF PIN SET 74D110060-2045)
12	BOLT

20030304

Figure 3. Removal of Outer Wing with Damaged Wing Fold Transmission (Sheet 4)

ORGANIZATIONAL, MAINTENANCE

STRUCTURAL REPAIR

WING SEALING REQUIREMENTS

Reference Material

Structure Repair - Wing	A1-F18AC-SRM-210
Wing Fuel Tank Fillet and Packing Sealing Procedures	WP018 00
Wing Fuel Tank Dam Gap Seals Repair	WP018 01
Wing Fuel Tank Channel Groove Seal Injection	WP019 00
Line Maintenance Procedures	A1-F18AC-LMM-000
Structural Repair - General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00

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Fillet Sealing	2
Fuel Tank Sealing	2
Internal Fastener Sealing	1
Joggle Sealing	2
Tooling Hole Sealing	2

Record of Applicable Technical Directives

None

Support Equipment Required

None

Materials Required

None

1. SEALING.

2. This work package contains types of sealing required in the wing. Several application methods are

used; internal fasteners, tooling holes, joggles, fillet, and fuel tank sealing. Wing fuel tank cavities are sealed to prevent both fuel and fumes from entering other compartments of the aircraft. Wing structural and moldline skins are sealed for foreign object containment. Fuel is drained from the cavities through fuel drains. For exterior drain locations (A1-F18AC-LMM-000). Repair to a cavity or removal and replacement of a structural part shall be sealed.

3. INTERNAL FASTENER SEALING. Fasteners are sealed with MIL-S-83430 sealant. For sealing

preparation and application (A1-F18AC-SRM-200, WP011 00).

4. TOOLING HOLE SEALING. Tooling holes are sealed with MIL-S-83430 sealant for prevention of foreign object damage. Drain holes and pathways must be clear of sealant. For sealant preparation and application (A1-F18AC-SRM-200, WP011 00).

5. JOGGLE SEALING. Joggles are sealed with MIL-S-83430 sealant. For sealant preparation and application (A1-F18AC-SRM-200, WP011 00).

6. FILLET SEALING. Fillets are sealed with MIL-S-83430 sealant. Wing fuel tank fillet sealing (WP018 00). For sealant preparation and application (A1-F18AC-SRM-200, WP011 00).

7. FUEL TANK SEALING. For dam gap sealing (WP018 01). Fillet and packing sealing (WP018 00). For channel groove sealing (WP019 00). Fasteners shall be installed wet with MIL-S-83430 sealant. For sealant preparation and application (A1-F18AC-SRM-200, WP011 00).

8. FOREIGN OBJECT CONTROL. See figure 1.

9. Foreign object containment areas must be sealed to prevent foreign objects from escaping into engines, fight controls, or other compartments.

10. FOREIGN OBJECT CONTAINMENT AREAS. See figure 1. Foreign object containment areas are described below:

a. Containment Area 1. Wing torque box - fueled area.

b. Containment Area 2. Outer wing.

c. Containment Area 3. Aileron leading edge from XW154.00 to XW225.50.

d. Containment Area 4. Trailing edge flap from XW44.25 to 56.80

e. Containment Area 5. Trailing edge flap from XW68.55 to XW111.00.

f. Containment Area 6. Trailing edge flap from XW124.30 to XW152.65.

11. FOREIGN OBJECT SEALING. Presence of foreign objects trapped in containment areas after repairs, installation of parts, or fastener replacement is allowed, if the conditions below are met:

a. Foreign objects accessible during repair or installation of parts have been removed.

b. All tooling holes, joggles, slots, wire bundle through structure, and any other openings except drain holes, are sealed with MIL-S-83430 sealant to prevent foreign objects from escaping into other compartments. For sealant preparation and application (A1-F18AC-SRM-200, WP011 00).

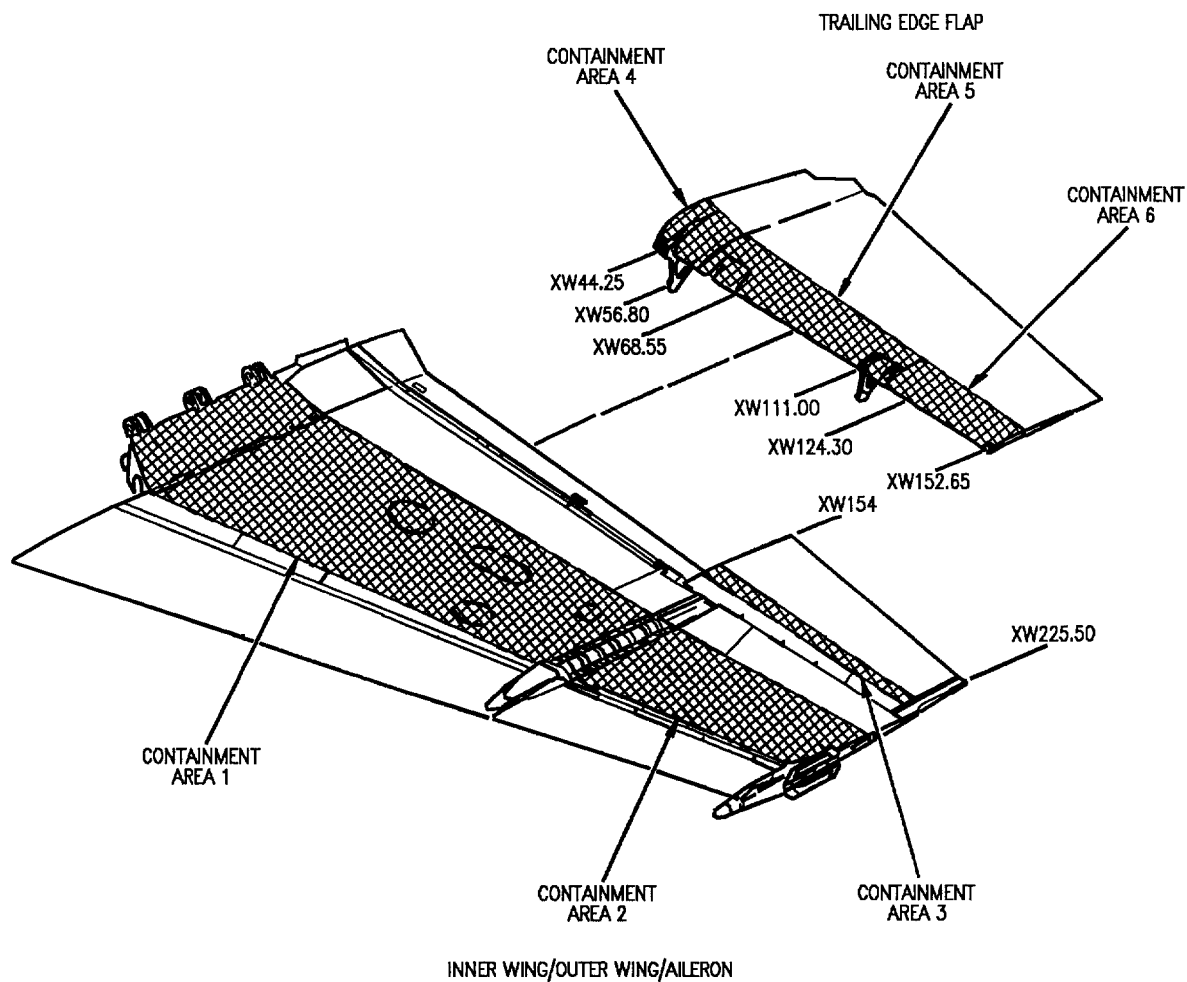


Figure 1. Foreign Object Containment Areas

ORGANIZATIONAL AND INTERMEDIATE MAINTENANCE

STRUCTURE REPAIR

EXTERNAL FUEL TANK, CYLINDRICAL, PART NO. 74A551000

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
External Fuel Tank, Cylindrical, Part No. 74A551000 Survivability	
Wrap Class I Thru VII Damage Repair	WP022 01
External Fuel Tank Cylindrical Part No. 74A551000 Survivability	
Wrap Class VIII Thru X Damage Repair	WP022 02
External Fuel Tank, Cylindrical, Part No. 74A551000 Metal Repair	WP022 04
Aircraft Corrosion Control	A1-F18AC-SRM-500
Cylindrical External Fuel Tank, 74A551000, Finish System and Markings	WP046 00
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Structure Repair, Typical Repair	A1-F18AC-SRM-250
Water Removal	WP005 00
Aluminum, Graphite Epoxy, or Titanium Patch Installation and Removal	WP007 00
Aircraft Weapons Systems Cleaning and Corrosion Control	NAVAIR 01-1A-509

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Damage Evaluation	4
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Repairs	7

Record of Applicable Technical Directives

None

Support Equipment Required

None

Materials Required

None

1. METAL SKIN AND STRUCTURE.

2. **DAMAGE EVALUATION.** See figures 1 and 2. Damage is classified as negligible and repairable. The types of materials used are shown on figure 1 and repair zones are shown on figure 2. Locating and determining size of damage by visual method is organizational maintenance. Damage not listed or exceeding the limits below requires a depot engineering disposition.

3. **Negligible Damage.** See figure 3. Negligible damage is damage that may be allowed to exist as is. However, preventive maintenance for temporary corrosion arrestment should be done to scratches (NAVAIR 01-1A-509 and A1-F18AC-SRM-500, WP046 00). Type and limits are:

a. Dents.

(1) Smooth dents only.

(2) No more than 0.125 inch in depth in zones I, II, III and IV.

(3) No more than 0.080 inch in depth in zones V, VI, and VII.

(4) Diameter is not more than 1.25 inches in zones I, II, III, and IV.

(5) Diameter is not more than 0.80 inch in zones V, VI, and VII.

(6) A minimum radius of ten times the depth.

(7) No cracks, gouges, nicks, or sharp edges.

(8) Scratches allowed up to 0.001 inch in depth.

b. Scratches, nicks, corrosion, and gouges.

(1) No more than 0.001 inch in depth.

(2) Length is more than 2.5 inches in zone I.

(3) Length is no more than 5.5 inches in zones II and V.

(4) Length is no more than 9.5 inches in zones III, IV, VI, and VII.

4. **Repairable Damage.** See figure 4. Repairable damage is damage that can be permanently repaired with no adverse effect on structural integrity, flight characteristics, or safety of the tank. Types and limits are:

a. Smooth dents exceeding the limits under negligible damage shall be repaired per tables 1 and 2.

b. Smooth dents that do not exceed the limits under negligible damage, containing scratches, nicks, gouges, or corrosion.

(1) Scratches, nicks, gouges, or corrosion in zone I shall be blended to a maximum depth of 0.015 inch.

(2) Scratches, nicks, gouges, or corrosion in zones II, III, and IV shall be blended to a maximum depth of 0.010 inch.

(3) Scratches, nicks, gouges, or corrosion in zones V, VI, and VII shall be blended to a maximum depth of 0.006 inch.

(4) Damage exceeding the limits in zones I through VII shall be repaired per tables 1 and 2.

c. Dents with sharp corners, punctures, deep abrasions, or cracks shall be repaired per tables 1 and 2.

d. Scratches, Nicks, and Gouges.

(1) Damage in zone I, not exceeding 0.025 inch in depth and 2 inches in length shall be blended.

(2) Damage in zones II not exceeding 0.015 inch in depth and 5 inches in length shall be blended.

(3) Damage in zones III and IV not exceeding 0.015 inch in depth and 9 inches in length shall be blended.

(4) Damage in zone V not exceeding 0.006 inch in depth and 5 inches in length shall be blended.

(5) Damage in zone VI and VII not exceeding 0.006 inch in depth and 9 inches in length shall be blended.

(6) Damage exceeding the limits in zones I through VII shall be repaired per tables 1 and 2.

e. Cracks.

(1) Damage in zone I not exceeding 0.090 inch in width and 1 inch in length shall be repaired by repair procedure one (WP022 04).

(2) Damage in zones II not exceeding 0.063 inch in width and 4 inches in length shall be repaired by repair procedure one (WP022 04).

(3) Damage in zones III, IV, V, VI, and VII shall be repaired per tables 1 and 2.

f. Punctures.

(1) Damage shall be repaired per tables 1 and 2.

g. Corrosion.

(1) Damage in zone I not exceeding 0.018 inch in depth and 2 inches in diameter shall be arrested (NAVAIR 01-1A-509).

(2) Damage in zone II not exceeding 0.013 inch in depth and 5 inches in diameter shall be arrested (NAVAIR 01-1A-509).

(3) Damage in zones III and IV not exceeding 0.013 inch in depth and 9 inches in diameter shall be arrested (NAVAIR 01-1A-509).

(4) Damage in zone V not exceeding 0.006 inch in depth and 5 inches in diameter shall be arrested (NAVAIR 01-1A-509).

(5) Damage in zones VI and VII not exceeding 0.006 inch in depth and 9 inches in diameter shall be arrested (NAVAIR 01-1A-509).

(6) Damage exceeding the limits in zones I through VII shall be repaired per tables 1 and 2.

Table 1. Preferred Repair Procedures






Damage Size Limits			
Zone	Repair Procedure	Maximum Size	Minimum Size
I	Replace Cone	NA	NA
II	 One	1.5 Inches Length	NA
	 Two	1.5 Inches Diameter	NA
III	Three	2.5 Inches Diameter	NA
IV	Three	2.5 Inches Diameter	NA
V	 2	NA	NA
VI	Three	2.5 Inches Diameter	NA
VII	Four	2.5 Inches Diameter	NA
NOTES			
 Scratches, nicks, gouges, and cracks only.			
 Depot Engineering Disposition.			

Table 2. Alternate Repair Procedures

Damage Size Limits			
Zone	Repair Procedure	Maximum Size	Minimum Size
I	Replace Cone	NA	NA
II	Five	4.0 Inches By 2.25 Inches	2.75 Inches By 0.50 Inch

Table 2. Alternate Repair Procedures (Continued)

Damage Size Limits			
Zone	Repair Procedure	Maximum Size	Minimum Size
III	Six	6 Inches By 2.75 Inches	2.75 Inches By 0.50 Inch
IV	Six	6 Inches By 2.75 Inches	2.75 Inches By 0.50 Inch
V	Five	4.0 Inches By 2.25 Inches	2.75 Inches By 0.50 Inch
VI	Six	6 Inches By 2.75 Inches	2.75 Inches By 0.50 Inch
VII	Six	3 Inches By 0.75 Inch	2.75 Inches By 0.50 Inch



Do not weld within the hardback area or within 2.5 inches of the frames centerline. Welding in these areas will cause damage.

5. **REPAIRS.** See figure 2, for repair zones. Refer to WP022 04 for repair of aluminum skins free of structure.

6. REPLACEMENTS.

a. Support (74A551029) is replaceable. Fastener attaching hardware is shown on figure 5.

b. Frame (74A551039) is replaceable. Fastener attaching hardware is shown on figure 6.

c. Frame (74A551019) is replaceable. Fastener attaching hardware is shown on figure 7.

d. Adapter (457-868-1) is interchangeable. Fastener attaching hardware is shown on figure 8.

e. Ring (74A551091) is replaceable. Fastener attaching hardware is shown on figure 9.

f. Cover (Door 517) is interchangeable. Fastener attaching hardware is shown on figure 10.

g. Cover (Door 516) is interchangeable. Fastener attaching hardware is shown on figure 11.

7. SURVIVABILITY WRAP.

8. **DAMAGE EVALUATION.** Damage is classified as negligible and repairable. Locating and determining size of damage by visual and coin tapping method is organizational maintenance. Locating and determining size of damage, and presence of moisture in core by NDI method is intermediate maintenance. Damage not listed or exceeding the limits below requires a depot engineering disposition.

9. **Negligible Damage.** See figure 3. Negligible damage may be allowed to exist as is. Types and limits are:

a. Dents.

- (1) No breaks or cracks in surface.
- (2) Less than 1 inch in diameter.
- (3) Maximum of three dents in a 12 inch diameter circle.
- (4) Minimum spacing between dents is three diameters of the largest dent edge to edge.

b. Delamination or unbonds.

- (1) Less than 1 inch in diameter.

10. **Repairable Damage.** See figure 4. Repairable damage is damage that can be permanently repaired with no adverse affect on structural integrity, flight characteristics, or safety of aircraft.

11. **Minor Surface Finish Defects, Class I Damage.** Class I damage does not require immediate repair, but shall be repaired as soon as practical. Class I damage is:

- a. Dents, scratches, pits, erosion, or abrasions.

- (1) Damage not into fiberglass laminate.

12. Outer Fiberglass Laminate Surface Ply Damage, Class II Damage.

See figure 4, section A. Class II damage is:

- a. Dents, cuts, scratches, pits, erosion, or abrasions.

- (1) Depth is not more than 0.01 inch in zones I and II.

- (2) Depth is not more than 0.005 in zones III and IV.

- (3) Depth does not include surface finish or sealing materials.

13. Outer Fiberglass Laminate Damage, Class III Damage. See figure 4, section B. Class III damage is:

- a. Dents, cuts, scratches, pits, erosion, or abrasions.

- (1) Depth is not more than 0.02 inch in zone I.

- (2) Depth is not more than 0.029 inch in zones II, III, and IV.

- (3) Diameter is not more than 2.62 inches.

- (4) Distance between damages is no less than one diameter edge to edge.

- (5) Depth of damage does not include surface finish or sealing materials.

14. Outer Fiberglass Laminate Damage, Unbonds, and Delaminations, Class IV Damage. See figure 4, section C. Class IV damage is:

- a. Dents, cuts, scratches, pits, erosion, or abrasions.

- (1) Depth is not more than 0.02 inch in zone I.

- (2) Depth is not more than 0.029 inch in zones II, III, and IV.

- (3) Diameter is not more than 5 inches in zone I.

- (4) Diameter is not more than 8 inches in zone II.

- (5) Diameter is not more than 12 inches in zones III and IV.

- (6) Distance between damages is no less than one diameter edge to edge.

- (7) Depth of damage does not include surface finish or sealing materials.

- (8) Distance from edge of damage to any attachment or opening is no less than 2 inches.

- b. Unbonds or delaminations.

- (1) Depth is not more than 0.04 inch in zone I.

- (2) Depth is not more than 0.06 inch in zones II, III, and IV.

- (3) Diameter is more than 1 inch, but less than or equal to 5 inches in zone I.

- (4) Diameter is more than 1 inch, but less than or equal to 8 inches in zone II.

- (5) Diameter is more than 1 inch, but less than or equal to 12 inches in zones III and IV.

- (6) Distance between damages is no less than one diameter edge to edge.

- (7) Depth of damage does not include surface finish or sealing materials.

- (8) Distance from edge of damage to any attachment or opening is no less than 2 inches.

15. Outer Skin and Honeycomb Core Damage, Class V Damage. See figure 4, section D. Class V damage is:

- a. Cuts, scratches, pits, erosion or abrasions.

- (1) Full penetration of outer skin and honeycomb core.

- (2) Diameter is not more than 1 inch.

- (3) No damage to inner fiberglass plies.

- (4) Distance between damages is no less than one diameter edge to edge.

(5) No more than three class V repairs per tank.

(6) Distance from edge of damage to any attachment or opening is no less than 2 inches.

16. Dents With Crushed Honeycomb Core, Class VI Damage. See figure 4, section E. Class VI damage is:

a. Dents.

(1) Depth is not more than 0.10 inch.

(2) Diameter is not more than 5 inches in zone I.

(3) Diameter is not more than 8 inches in zone II.

(4) Diameter is not more than 12 inches in zones III and IV.

(5) Distance between damages is no less than one diameter edge to edge.

(6) Distance from edge of damage to any attachment or opening is no less than 2 inches.

17. Outer Skin, Honeycomb Core Damage and/or Dents With Crushed Core, Class VII Damage. See figure 4, section F. Class VII damage is:

a. Cuts, scratches, pits, erosion or abrasions.

(1) Full penetration of outer skin and honeycomb core.

(2) No damage to inner fiberglass plies.

(3) Diameter is not more than 5 inches in zone I.

(4) Diameter is not more than 8 inches in zone II.

(5) Diameter is not more than 12 inches in zones III and IV.

(6) Distance between damages is no less than one diameter edge to edge.

(7) Distance from edge of damage to any attachment or opening is no less than 2 inches.

b. Dents.

(1) Depth is not more than 0.10 inch.

(2) Diameter is not more than 5 inches in zone I.

(3) Diameter is not more than 8 inches in zone II.

(4) Diameter is not more than 12 inches in zones III and IV.

(5) Distance between damages is no less than one diameter edge to edge.

(6) Distance from edge of damage to any attachment or opening is no less than 2 inches.

18. Outer Skin, Honeycomb Core, Inner Fiberglass Ply Damage, and Unbonds and/or Delaminations, Class VIII Damage. See figure 4, section G. Class VIII damage is:

a. Full penetration of outer skin, honeycomb core and inner fiberglass plies.

(1) No damage to aluminum shell.

(2) Diameter is not more than 5 inches in zone I.

(3) Diameter is not more than 8 inches in zone II.

(4) Diameter is not more than 12 inches in zones III and IV.

(5) Distance between damages is no less than one diameter edge to edge.

(6) Distance from edge of damage to any attachment or opening is no less than 2 inches.

b. Unbonds and/or delaminations.

(1) Depth is more than 0.30 inch.

(2) Diameter is more than 1 inch, but less than or equal to 5 inches in zone I.

(3) Diameter is more than 1 inch, but less than or equal to 8 inches in zone II.

(4) Diameter is more than 1 inch, but less than or equal to 12 inches in zones III and IV.

(5) Distance between damages is no less than one diameter edge to edge.

(6) Distance from edge of damage to any attachment or opening is no less than 2 inches.

19. Edge Delamination, Edge Damage and Damage at Fastener Holes in Solid Laminate, Class IX Damage. See figure 4, section H. Class IX damage is:

a. Edge damage.

(1) There must be at least two fastener diameters clearance between fastener hole and edge of damage.

(2) Damage must be removed in a stepped configuration. The deeper step may not extend more than 0.20 inch from the edge. The shallow step must be at least 0.07 inch shorter than the deeper step.

b. Fastener hole damage.

(1) Delaminations, may be open to honeycomb core.

(2) Unbonds, may be open to honeycomb core.

c. Edge Delamination.

(1) Length of damage is unlimited.

(2) Distance from edge must not exceed 2 inches.

20. Corrosion of Aluminum Skin, Class X Damage. Class X damage is corrosion that does not exceed the limits in paragraph 4 step g.

21. Water in Honeycomb Core, Class XI Damage. Class XI damage is water trapped in honeycomb core.

22. REPAIRS.

a. Repair classes I thru VII (WP022 01).

b. Repair classes VIII thru X (WP022 02).

c. Repair class XI, Water Removal (A1-F18AC-SRM-250, WP005 00).

d. Dry damaged area before repairing, Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).

e. Repair rain erosion coating on forward 20 inches of tank, Finish System (A1-F18AC-SRM-500, WP046 00).

23. NOSE CONE BOOT.

24. REPLACEMENT. See figure 12. Nose cone boot, SJ-8665FP-44, is replaceable. Replacement of boot is organizational maintenance. For correct boot installation, temperature shall be minimum of 60°F. Removal and replacement procedures are given below.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesion Film Promoter	No. 86
Hypodermic Needle, No. 15	GG-N-196
Isopropyl Alcohol	TT-I-735, Grade 1
Methyl Ethyl Ketone	TT-M-261
Nose Cone Boot	SJ-8665FP-44
Paper, Abrasive	A-A-1047, Grit 150
Rymple Cloth	AMS-3819
Sealing Compound	MIL-S-83430
Sponge or Spray Bottle	-
Squeegee, Plastic or Equivalent	-
Tape, Pressure Sensitive	A-A-883, Type 1, 1/2 inch
Toluene, Technical	TT-T-548
Washing Detergent, Liquid	-
Water, Tap	-

a. Remove damaged nose cone boot.

b. Visually inspect nose of tank for damage, if depth of damage is below erosion resistant coating repair coating.

c. Evaluate any damage to the nose cone. Refer to Damage Evaluation, this work package.

NOTE

If inspection shows no damage to erosion resistant coating or nose cone, proceed to step j for new boot installation procedures.

d. Make any required repairs to nose cone before application of new boot; trim off all erosion coating which may have pulled loose from substrate.

e. Feather edge of damaged erosion coating that will not be covered by boot. Use abrasive paper.

f. Sand finish to provide a smooth transition between undamaged coating and substrate. Replace coating.



Sealing Compound

5

g. Apply sealing compound into boot area where erosion coating is missing, Sealant Application (A1-F18AC-SRM-200, WP011 00).

h. Cure sealing compound (A1-F18AC-SRM-200, WP011 00).

i. After cure, sand sealant with abrasive paper to match surrounding contour; this will eliminate possibility of any unsupported areas under boot.

j. With edge flashing still on boot and polyethylene liner still in place, trial fit boot to nose of tank.

NOTE

Boot should fit nose of tank with only minor gaps and wrinkles.

k. Apply masking tape around the outside circumference of boot at the required trim location.

l. Remove boot and trim edge flashing with utility knife along the edge of masking tape line.



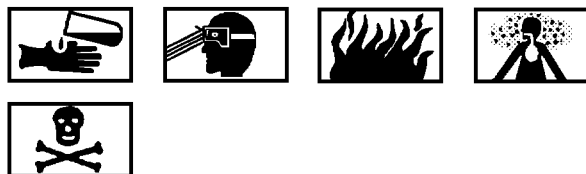
Methyl Ethyl Ketone

15



To avoid contamination of methyl ethyl ketone, always pour onto clean rymple cloth. Never dip rymple cloth into methyl ethyl ketone.

m. Clean the leading edge area of tank where boot is to be bonded with clean rymple cloth wetted with methyl ethyl ketone. Continue cleaning until no trace of contamination is present on clean rymple cloth.



Adhesion Film Promoter

16



Toluene

17

NOTE

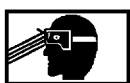
The abrasion film promoter is transparent and leaves a glossy appearance when applied.

Gap between fuel tank topcoat and leading edge of boot shall be minimum. The abrasion film promoter shall extend past the aft edge of boot. Boot edges shall stick to abrasion film promoter to avoid edge lifting failures.

n. Dilute abrasion film promoter with two parts toluene, and apply to area where boot will be applied.

o. Moisten clean rymple cloth with abrasion film promoter and apply a thin uniform coat using minimum amount that will fully coat the surface.

p. Turn boot inside out and remove polyethylene liner to expose adhesive.



Isopropyl Alcohol

4



Detergent (Liquid)

18

q. Mix 1 gallon of wetting solution = 1 quart isopropyl alcohol with 3 quarts water plus one tea-spoon of liquid detergent.

r. Thoroughly wet adhesive on boot and nose of tank with wetting solution using spray/mist applicator or sponge. Reinvert boot so it is now right side out.

NOTE

Do not rub boot in a fore to aft motion during initial application; this will force wetting solution from boot to substrate interface, causing premature adhesion before final positioning.

s. With surfaces still wet, center boot on tank and pull on snug from aft edge only.

t. After boot is in final position, use a plastic scraper to force wetting solution out from under boot and initiate adhesion of the boot. Start at the forward tip and proceed aft working the complete circumference of boot.

u. After installation of boot, visually inspect boot for any air bubbles; if air bubbles exist, puncture base of bubbles with a needle and work area with scraper until air is removed.

v. After air is removed, remove needle and with scraper or squeegee work out areas where needle was removed.



To make sure adhesive cures correctly, room temperature shall not be less than 60°F.

w. Cure for 24 hours at room temperature.

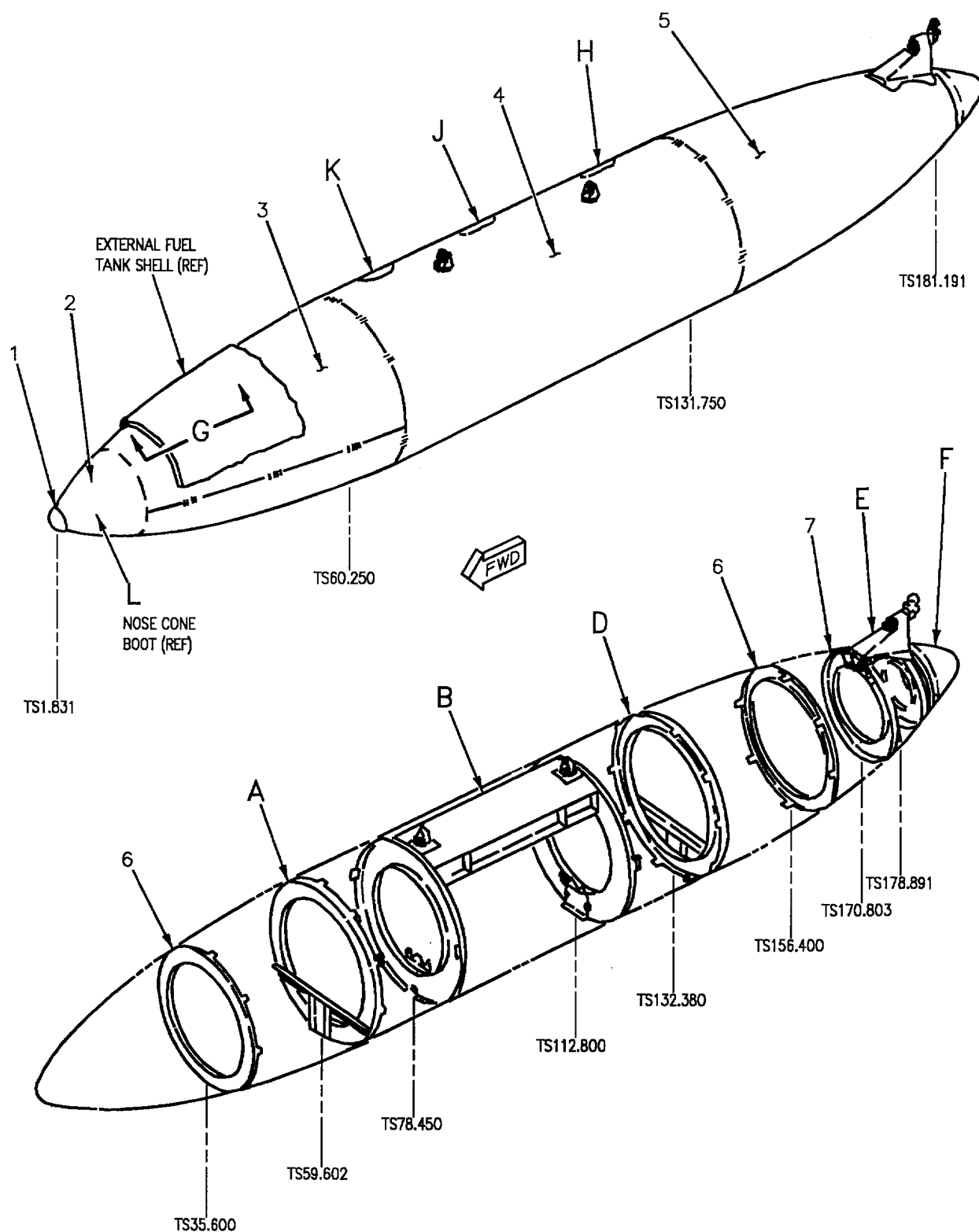


Figure 1. Material Index (Sheet 1)

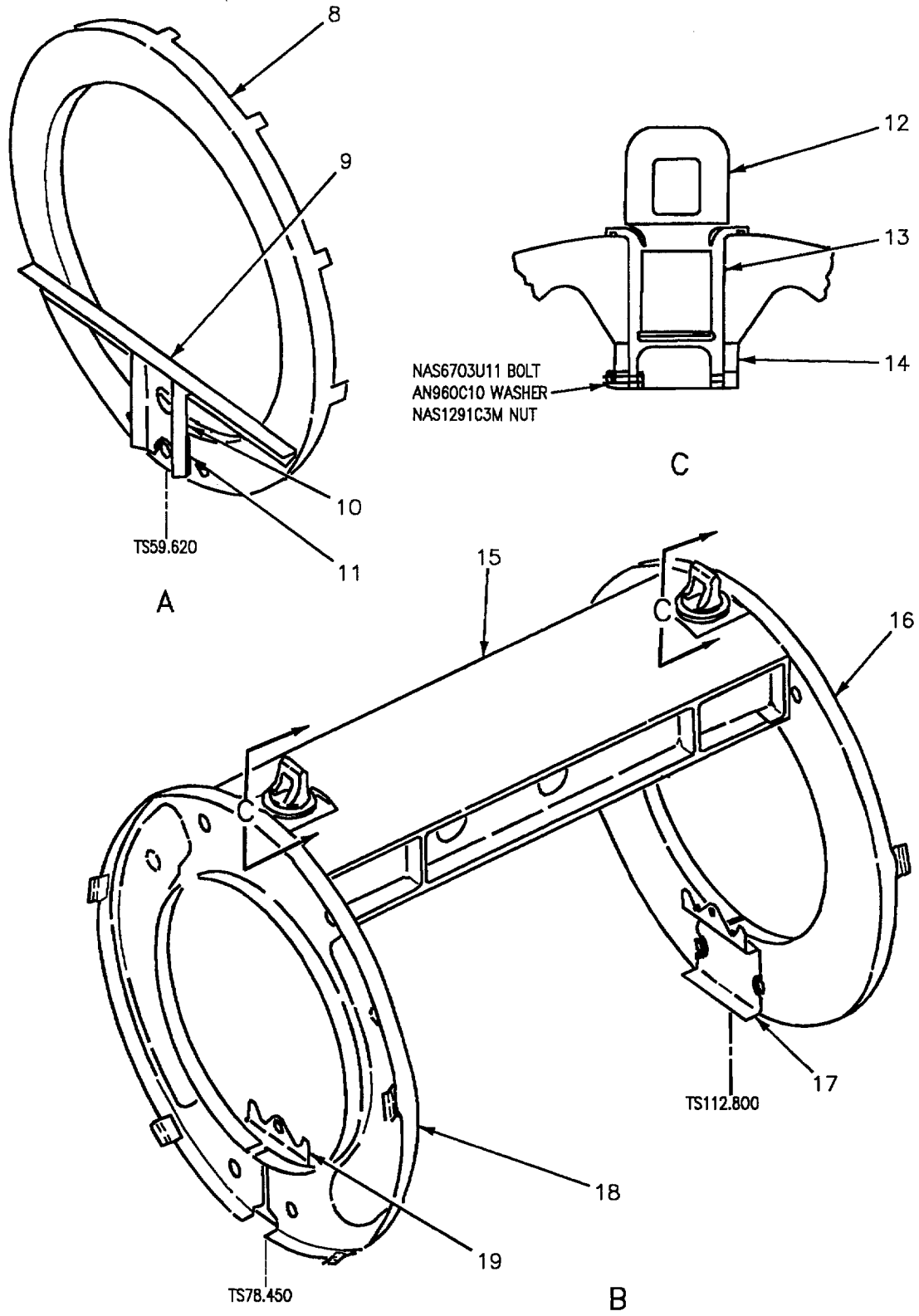


Figure 1. Material Index (Sheet 2)

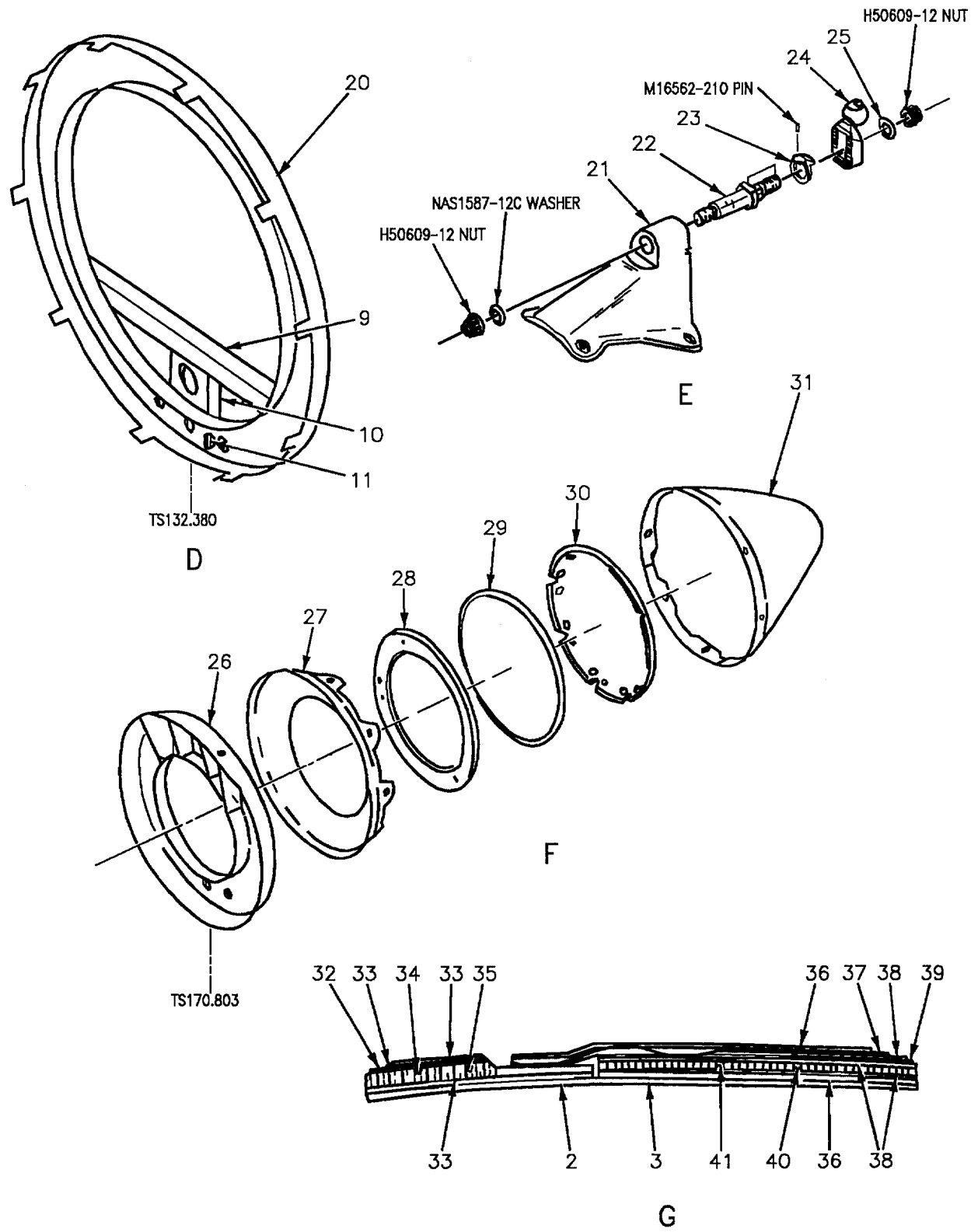


Figure 1. Material Index (Sheet 3)

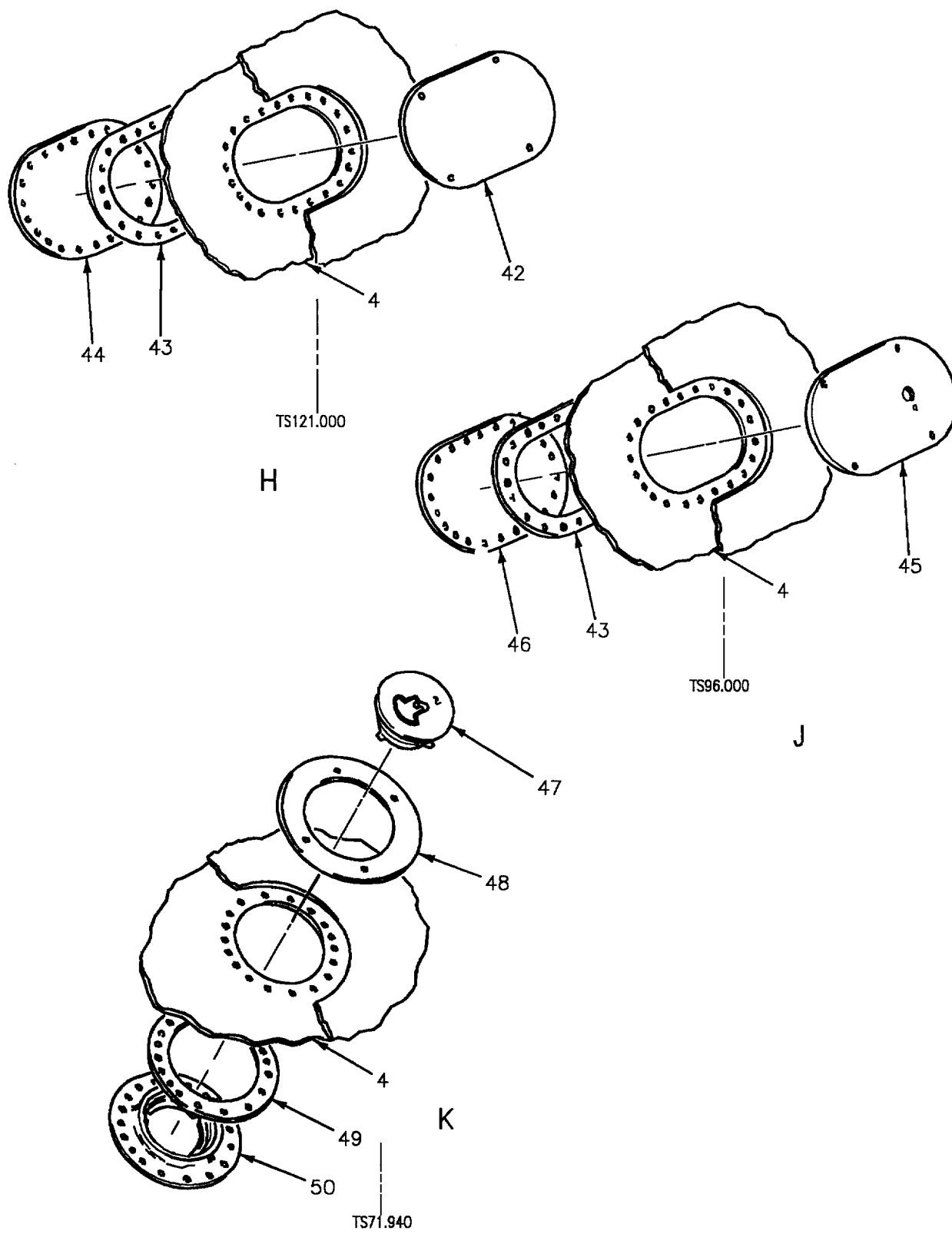


Figure 1. Material Index (Sheet 4)

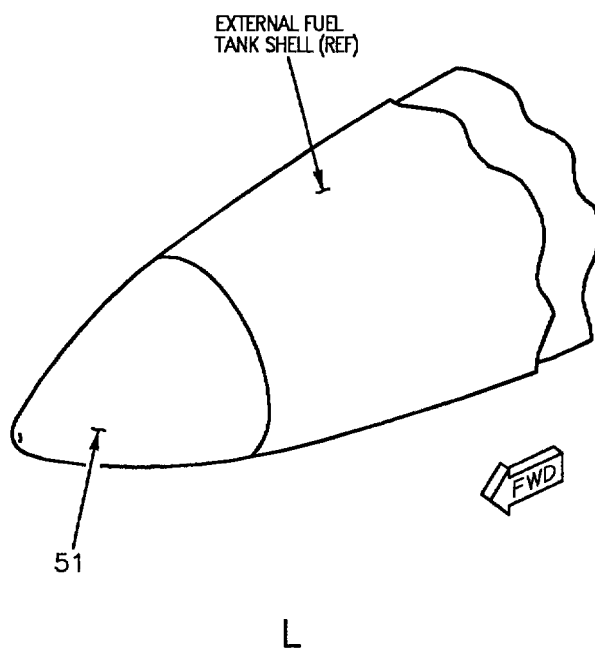


Figure 1. Material Index (Sheet 5)


Idx No.	Eft	Nomenclature and Part No.	Description	Material
1		Insert 74A551042-2009	Laminate	
2		Skin 74A551011-2001	0.090 Sheet	6061-T62 Al Aly
3		Skin 74A551011-2003	0.063 Sheet	6061-T62 Al Aly
4		Skin 74A551021-2005	0.063 Sheet	6061-T4 Al Aly
5		Skin 74A551011-2009	0.063 Sheet	6061-T42 Al Aly
6		Frame 74A551012-2001	0.063 Sheet	6061-T62 Al Aly
7		Frame 74A551039-2003	Forging	7075-T7351 Al Aly
8		Frame 74A551022-2003	0.063 Sheet	6061-T6 Al Aly
9		Angle 74A551022-2009	Extrusion	2024-T3511 Al Aly
10		Support 74A551022-2005	0.063 Sheet	7075-T6 Al Aly
11		Plate 74A551022-2007	0.090 Sheet	7075-T6 Al Aly
12		Lug 74A551032-2001	Forging	PH13-8MO CRES
13		Well 74A551033-2005	Forging	PH13-8MO CRES
14		Nut 74A551034-2001	Machining	4330 CRES
15		Support 74A551029-2005	Forging	7075-T73 Al Aly
16		Frame 74A551023-2013	0.160 Sheet	7075-T76 Al Aly
17		Splice 74A551023-2007	0.160 Sheet	7075-T76 Al Aly
18		Frame 74A551023-2015	0.160 Sheet	7075-T6 Al Aly

Figure 1. Material Index (Sheet 6)





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19		Splice 74A551023-2011	0.163 Sheet	7075-T6 Al Aly
20		Frame 74A551022-2001	0.063 Sheet	6061-T6 Al Aly
21		Support 74A551030-2002	Machining	7075-T73 Al Aly
22		Shaft 74A550677-2003	Machining	PH13-8MO CRES
23		Plate 74A550676-2003	Machining	PH13-8MO CRES
24		Adapter 74A550675-2003	Machining	PH13-8MO CRES
25		Washer 74A550691-2001	Machining	4340 CRES
26		Frame 74A551019-2003	Forging	7075-T73 Al Aly
27		Ring 74A551091-2001	Forging	6061-T42 Al Aly
28		Gasket 74A551093-2001	0.063 Sheet	
29		Door 74A551092-2001	0.090 Sheet	7075-T6 Alclad
30		Cover 74A551057-2001	0.250 Sheet	
31		Skin 74A551094-2001	0.090 Sheet	6061-T62 Al Aly
32		Ply 74A551042-2007	Laminated	Fiberglass
33		Ply 74A551042-2005	Laminate	Fiberglass
34		Filler 74A551042-2003	Foam	Urethane
35		Core 74A551042-2001		
36		Roving 74A551040-2005	Filament	Fiberglass

Figure 1. Material Index (Sheet 7)
















Idx No.	Eft	Nomenclature and Part No.	Description	Material
37		Roving 74A551040-2007	Filament	Graphite Fibers
38		Cloth 74A551040-2013	Roll	Woven Glass
39		Cloth 74A551040-2011	Roll	Carbon Fabric
40		Filler 74A551040-2003	Sheet	Urethane
41		Core 74A551040-2001		
42		Cover 74A551041-2001	0.250 Sheet	
43		Gasket 74A551025-2001	0.063 Sheet	
44		Cover (Door 517) 74A551024-2001	0.071 Sheet	7075-T6 Al Aly
45	 	Cover 74A551041-2007 74A551041-2009	0.250 Sheet	
46		Cover (Door 516) 74A551058-2005	0.071 Sheet	7075-T6 Alclad
47		Cap 457-885	-	-
48		Cover 74A551041-2005	0.250 Sheet	
49		Gasket 74A551073-2001	0.063 Sheet	
50		Adapter 457-868-1	0.063 Sheet	301 CRES
51		Boot SJ8665FP-44	Elastomeric	Polyurethane
<p style="text-align: center;">LEGEND</p> <p> Over-expanded core honeycomb.</p> <p> Nylon fiber paper base.</p> <p> Cork and rubber composition.</p> <p> Fiberglass reinforced plastic laminate.</p> <p> Tank 1 THRU 19.</p> <p> Tank 20 AND UP.</p>				

Figure 1. Material Index (Sheet 8)

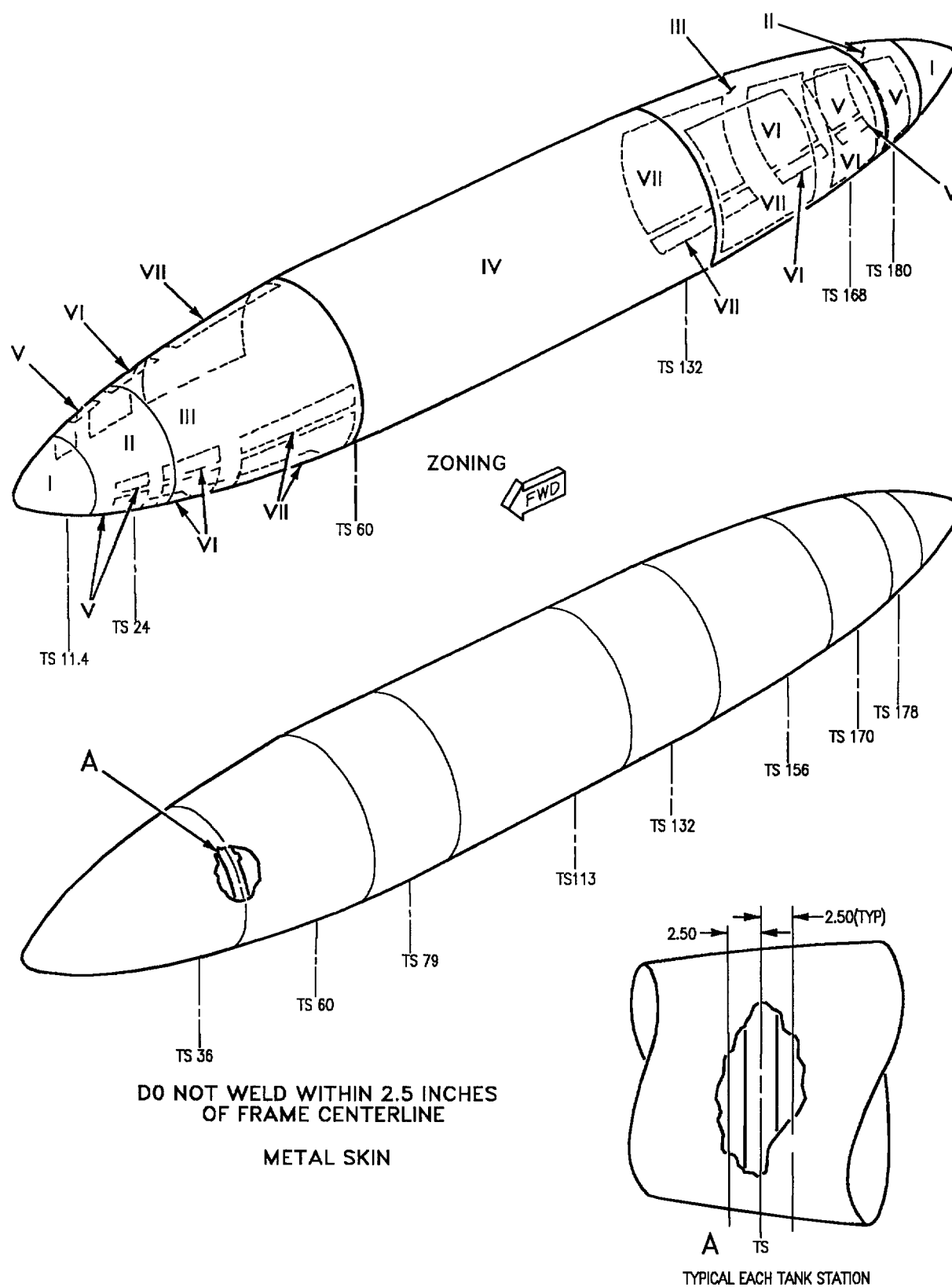
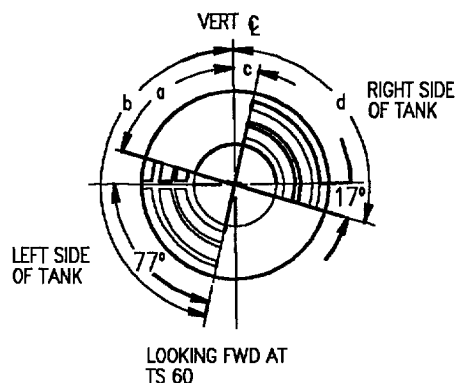


Figure 2. Repair Zones (Sheet 1)

ALL VERTICAL DIMENSIONS MEASURED IN INCHES FROM TOP OF TANK AT VERTICAL CENTER					
TANK STATION	a	b	TANK STATION	a	b
15.34	8.9	20.5	133.25	3.10	25.7
20.86	11.0	25.5	154.25	2.75	22.4
23.33	11.8	27.0	158.25	2.50	21.0
32.05	14.3	32.8	168.67	2.10	17.25
36.25	15.3	35.0	171.14	2.00	16.0
58.75	17.5	40.0	176.77	1.60	13.1



METHOD FOR DETERMINING CHEM-MILL
POCKETS ZONES V, VI, VII

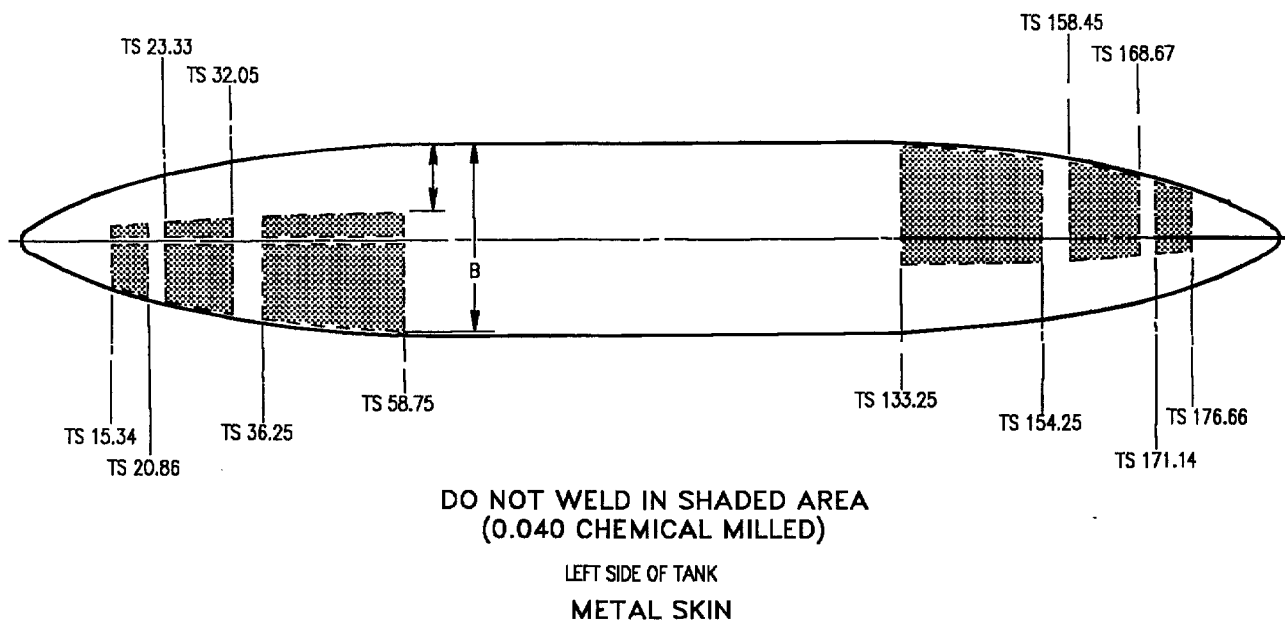
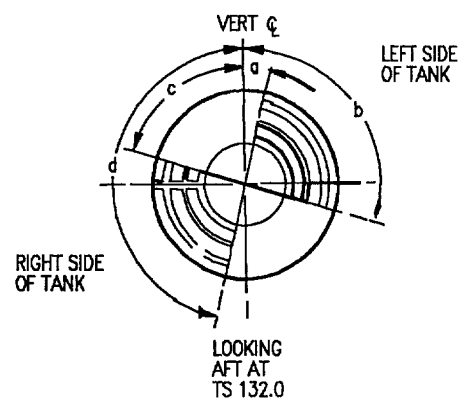
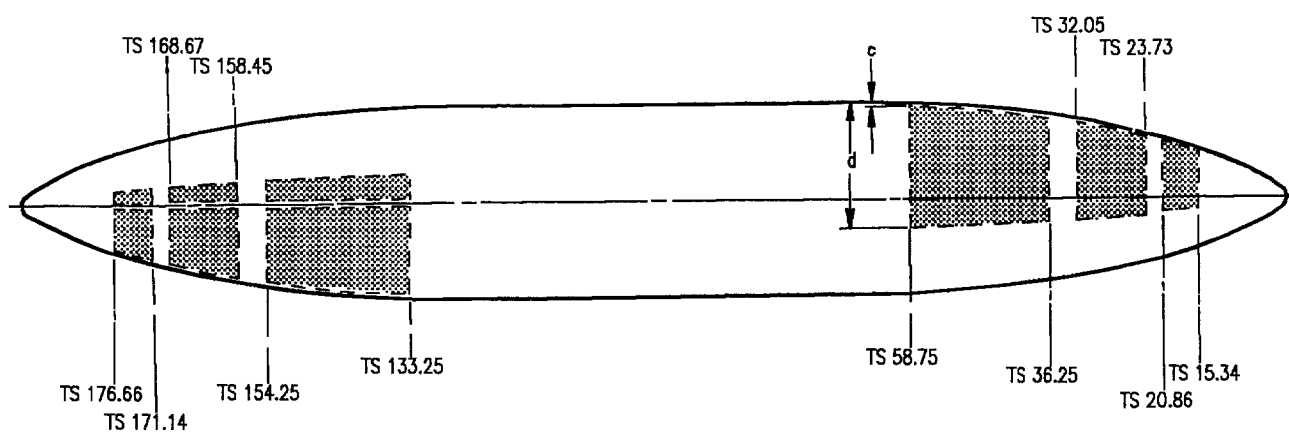


Figure 2. Repair Zones (Sheet 2)

ALL VERTICAL DIMENSIONS MEASURED IN INCHES FROM TOP OF TANK AT VERTICAL CENTER					
TANK STATION	c	d	TANK STATION	c	d
15.34	1.60	13.1	133.25	17.5	40.0
20.86	2.00	16.0	154.25	15.3	35.0
23.33	2.10	17.25	158.45	14.0	32.8
32.05	2.50	21.0	168.67	11.8	27.0
36.25	2.75	22.4	171.14	11.0	25.5
58.75	3.10	25.7	176.66	8.9	20.5



**METHOD FOR DETERMINING CHEM-MILL
POCKETS ZONES V, VI, VII**

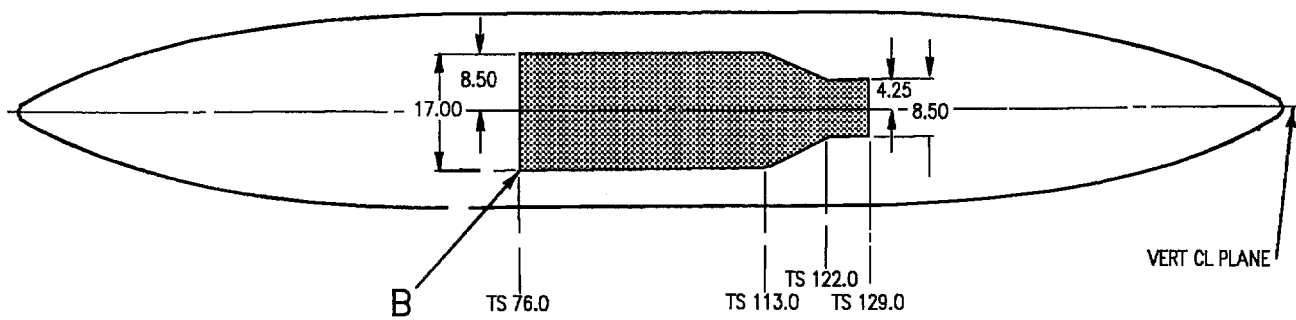


**DO NOT WELD IN SHADED AREA
(0.040 CHEMICAL MILLED)**

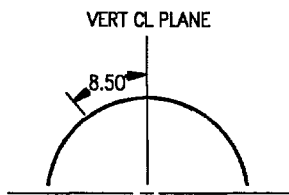
RIGHT SIDE OF TANK

METAL SKIN

Figure 2. Repair Zones (Sheet 3)



LOOKING DOWN
DO NOT WELD IN SHADED
AREAS (HARDBACK)

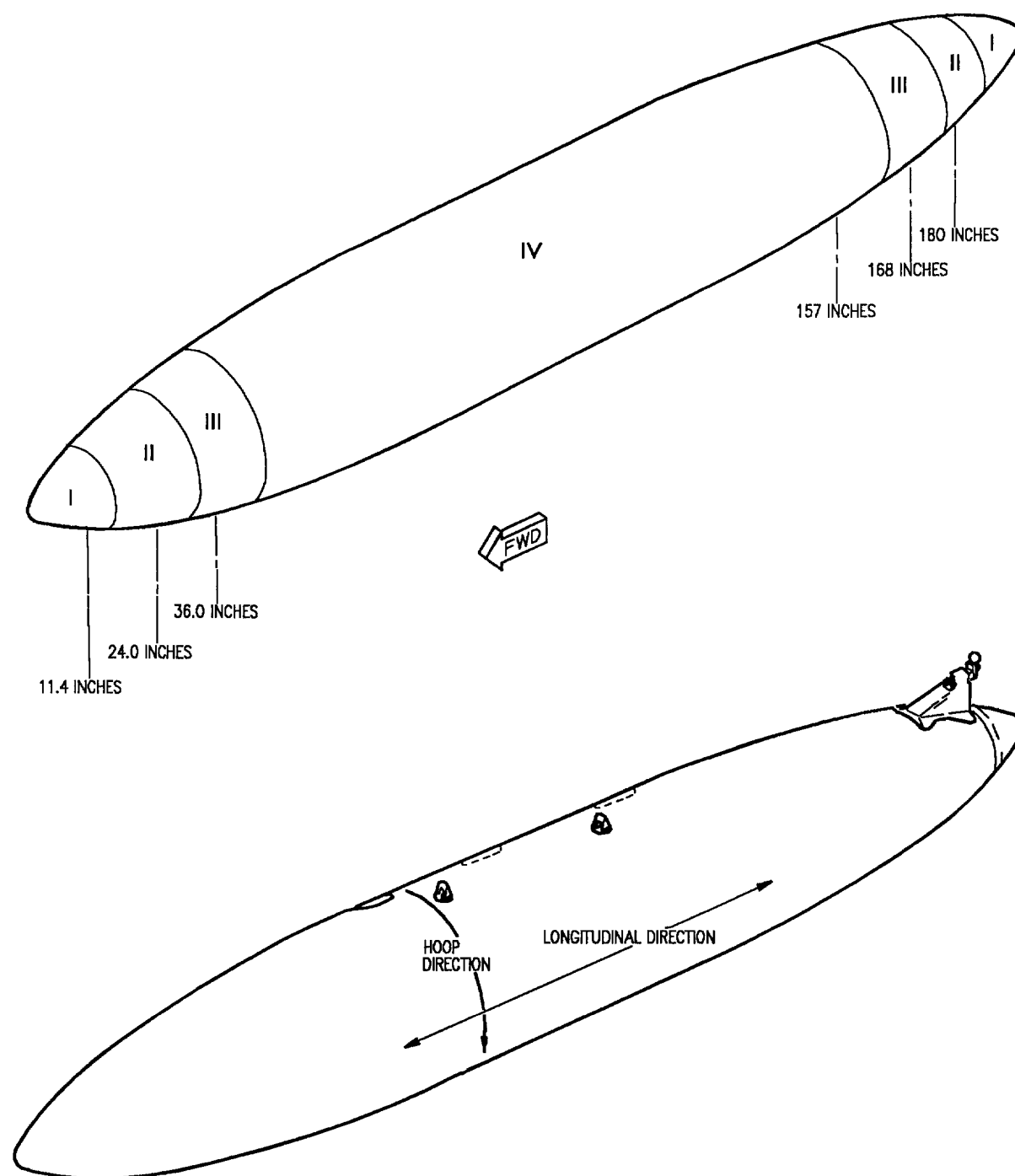


DIMENSION ARE MEASURED
AROUND TANK CIRCUMFERENCE

B

METAL SKIN
HARDBACK ZONE

Figure 2. Repair Zones (Sheet 4)



SURVIVABILITY WRAP

Figure 2. Repair Zones (Sheet 5)

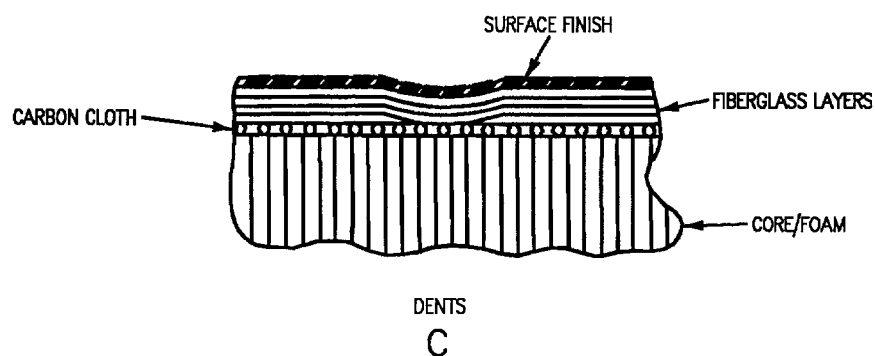
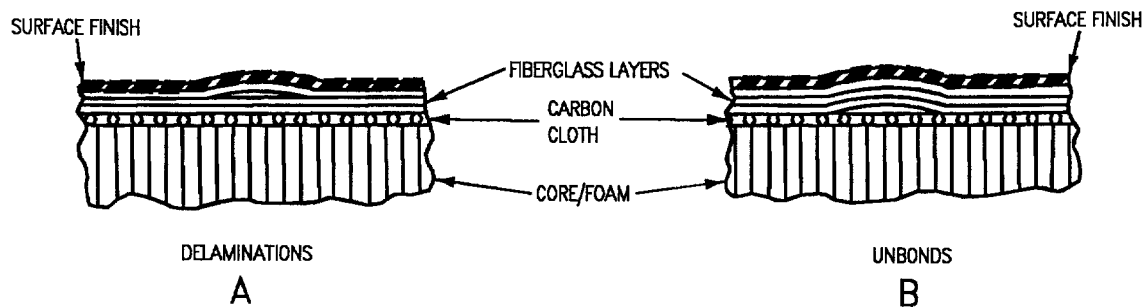
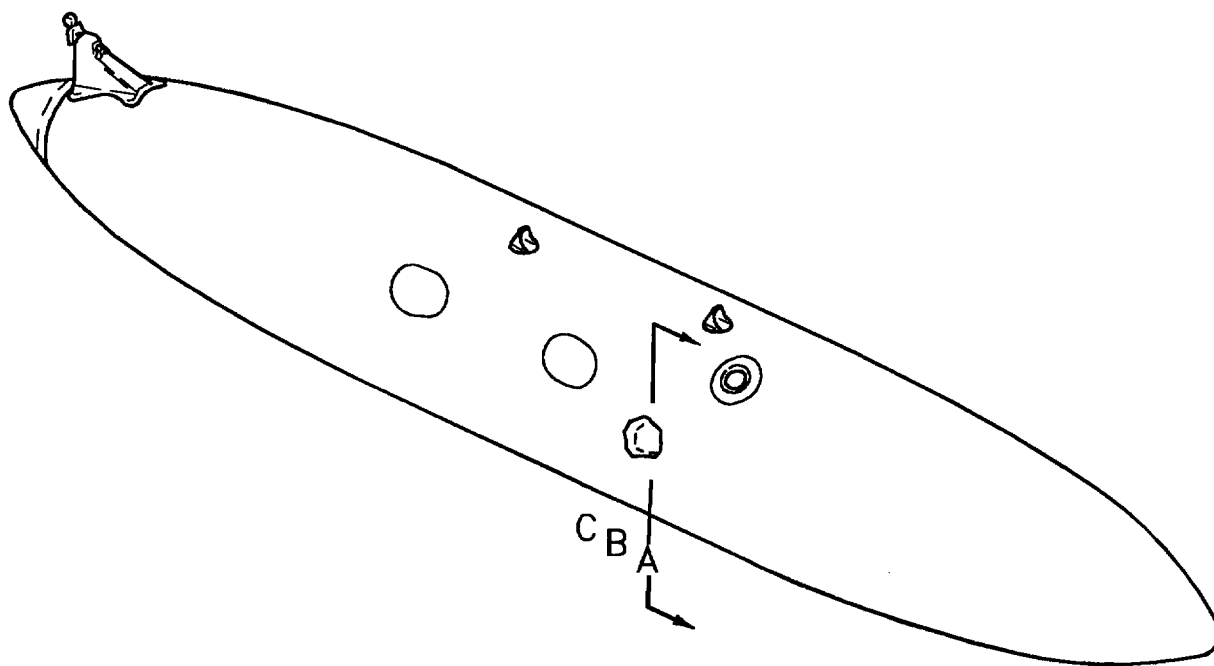


Figure 3. Negligible Damage

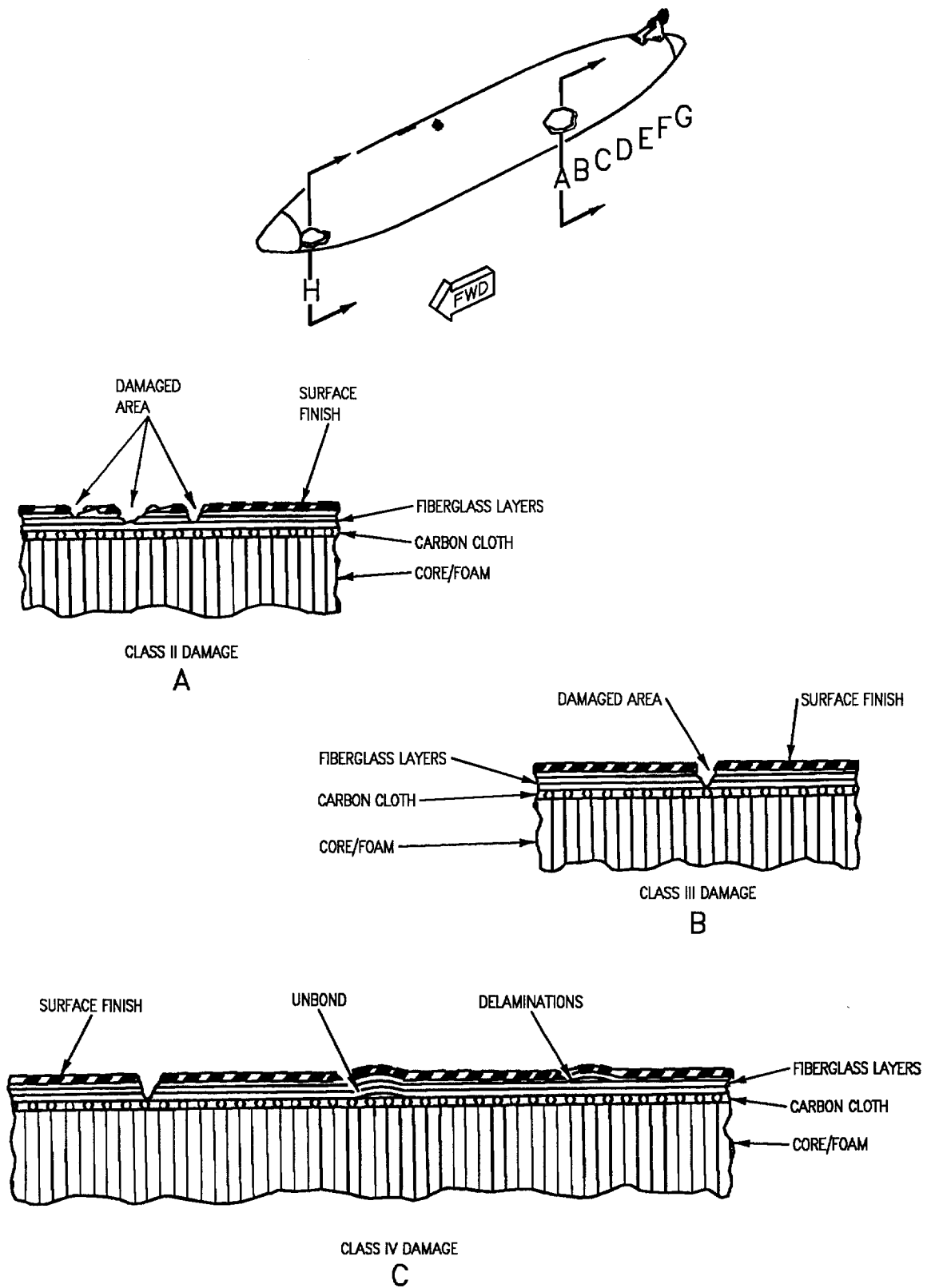


Figure 4. Repairable Damage (Sheet 1)

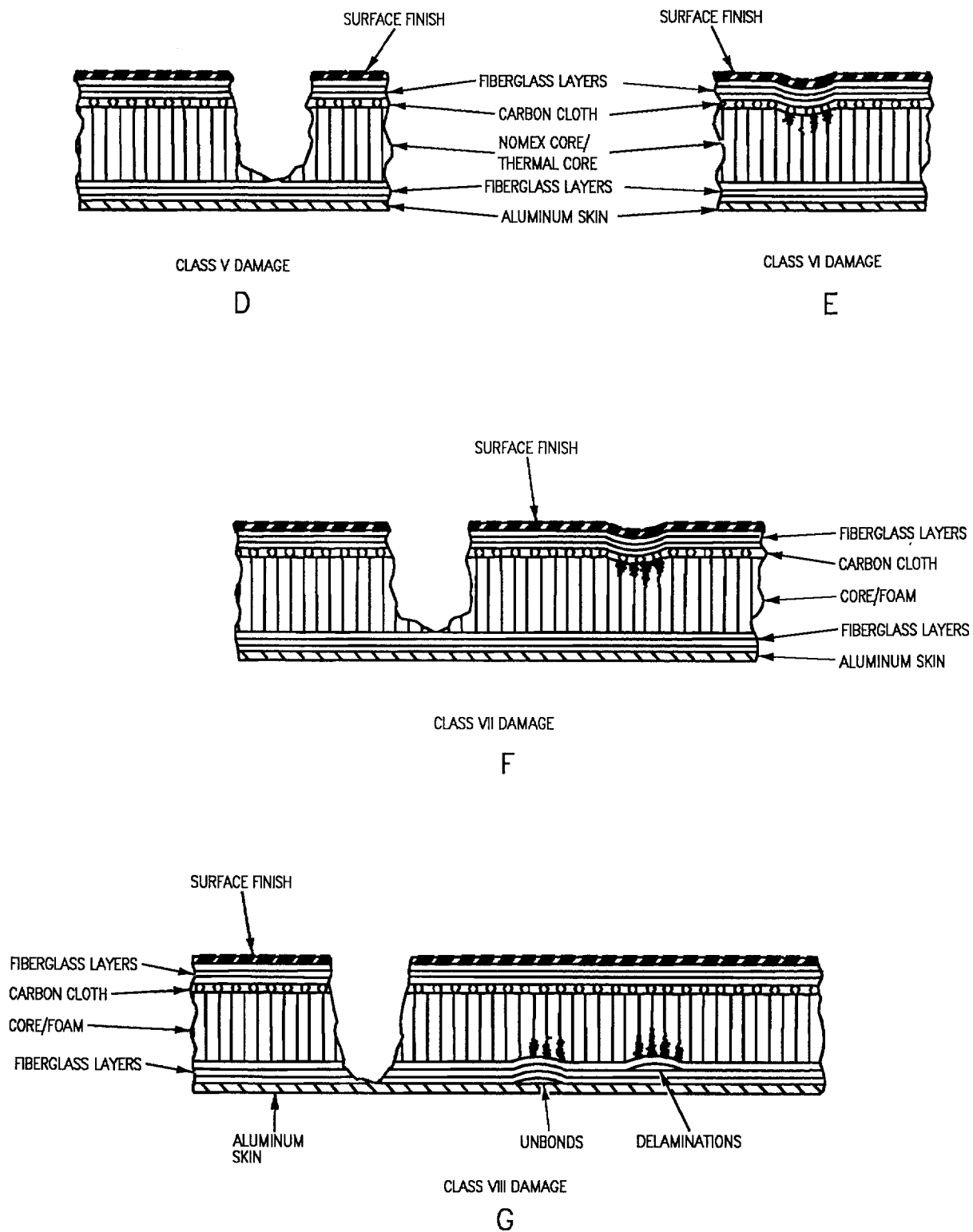


Figure 4. Repairable Damage (Sheet 2)

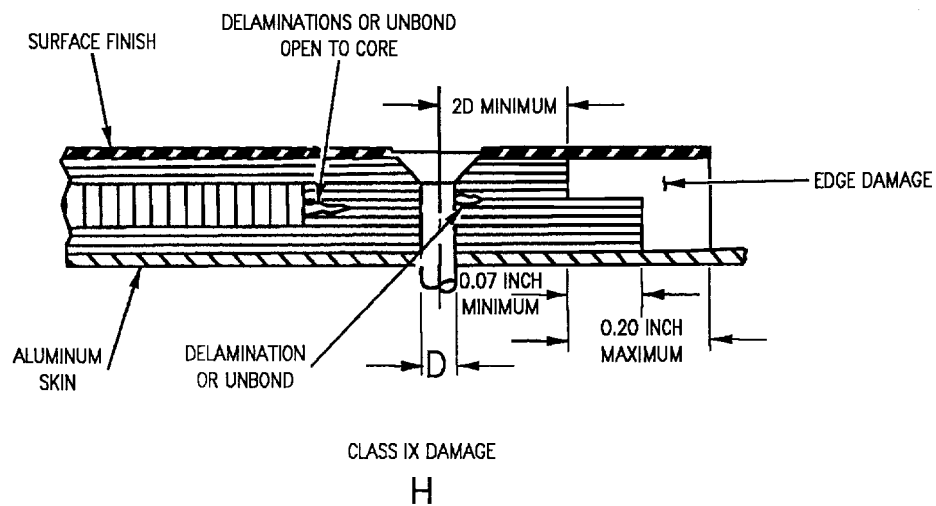


Figure 4. Repairable Damage (Sheet 3)

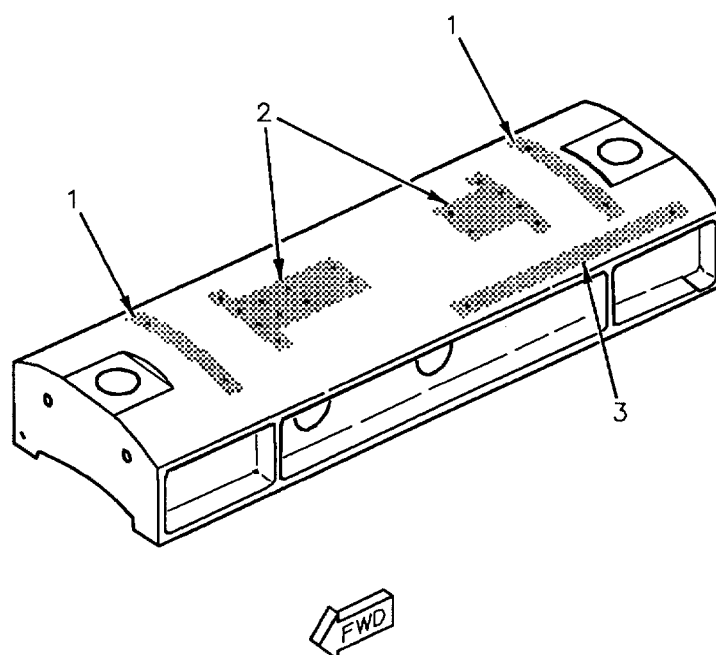


Figure 5. Support (74A551029) Replacement (Sheet 1)






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1			Plate Nut	F49249E5-2
2			Gang Channel	G18421PL2-5-10
3			Plate Nut	MS21060L3
<p style="text-align: center;">LEGEND</p> <p> Hole diameter is 0.312 +0.007 -0.000.</p> <p> Hole diameter is 0.195 +0.007 -0.000.</p>				

Figure 5. Support (74A551029) Replacement (Sheet 2)

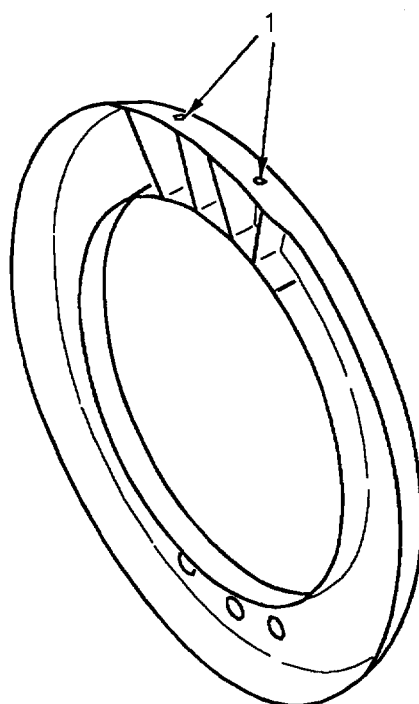


Figure 6. Frame (74A551039) Replacement (Sheet 1)



Idx No.	Eft		Nomenclature	Part Number
1			Plate Nut	F49249E6-1
LEGEND				
 Hole diameter is 0.375 +0.007 -0.000.				

Figure 6. Frame (74A551039) Replacement (Sheet 2)

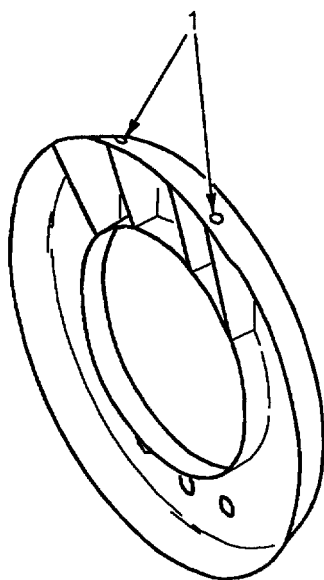


Figure 7. Frame (74A551019) Replacement (Sheet 1)



Idx No.	Eft		Nomenclature	Part Number
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LEGEND				
 Hole diameter is 0.375 +0.007 -0.000.				

Figure 7. Frame (74A551019) Replacement (Sheet 2)

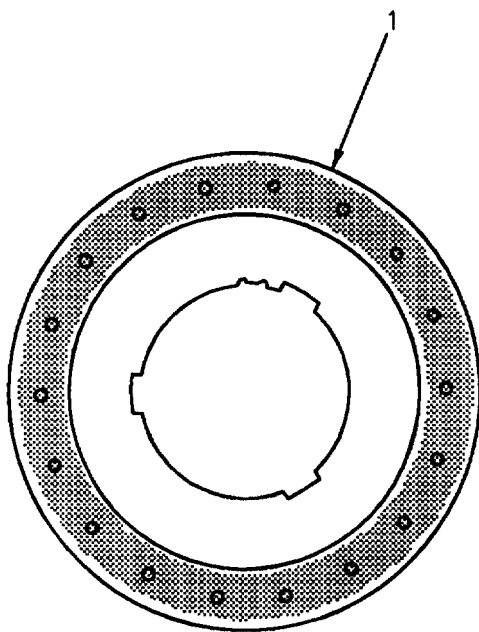


Figure 8. Adapter (457-868-1) Replacement (Sheet 1)



Idx No.	Eft		Nomenclature	Part Number
1			Plate Nut	F49249E3-1
LEGEND				
 Hole diameter is 0.191 +0.006 -0.000.				

Figure 8. Adapter (457-868-1) Replacement (Sheet 2)

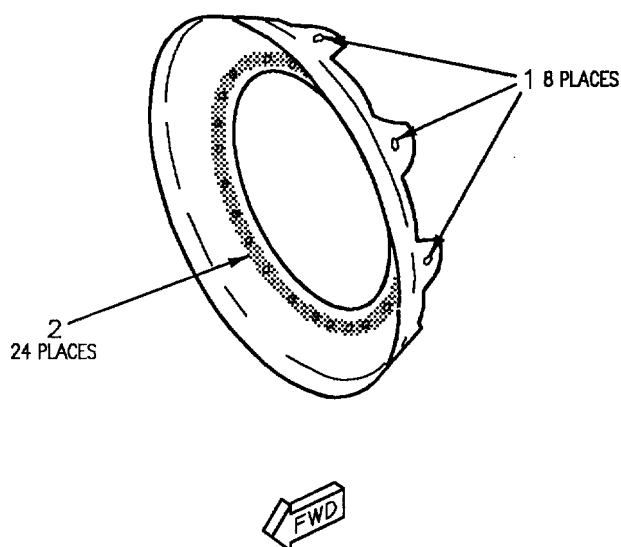


Figure 9. Ring (74A551091) Replacement (Sheet 1)





Idx No.	Eft		Nomenclature	Part Number
1			Plate Nut	MS21059L5
2			Plate Nut	F49249E3-2
<p style="text-align: center;">LEGEND</p> <p> Hole diameter is 0.322 +0.007 -0.000.</p> <p> Hole diameter is 0.212 +0.007 -0.000.</p>				

Figure 9. Ring (74A551091) Replacement (Sheet 2)

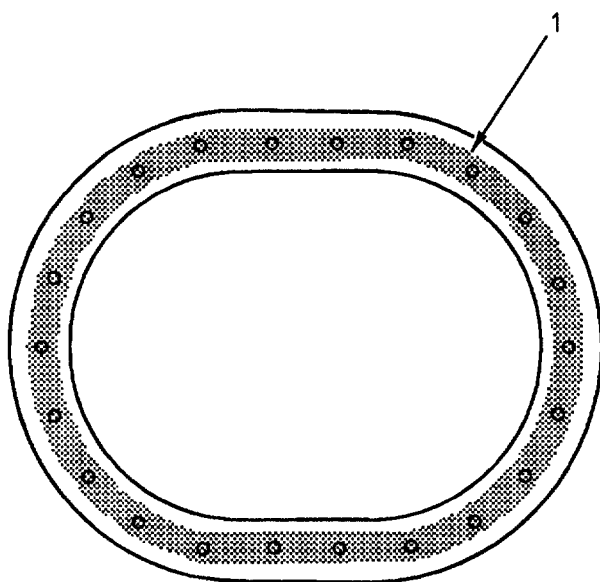


Figure 10. Cover (Door 517) Replacement (Sheet 1)



Idx No.	Eft		Nomenclature	Part Number
1			Plate Nut	F49249E3-1
LEGEND				
 Hole diameter is 0.191 +0.006 -0.000.				

Figure 10. Cover (Door 517) Replacement (Sheet 2)

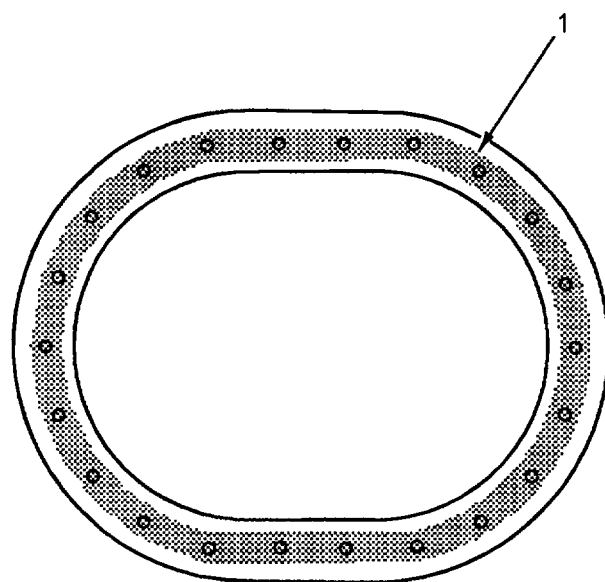


Figure 11. Cover (Door 516) Replacement (Sheet 1)



Idx No.	Eft		Nomenclature	Part Number
1			Plate Nut	F49249E3-1
LEGEND				
 Hole diameter is 0.191 +0.006 -0.000.				

Figure 11. Cover (Door 516) Replacement (Sheet 2)

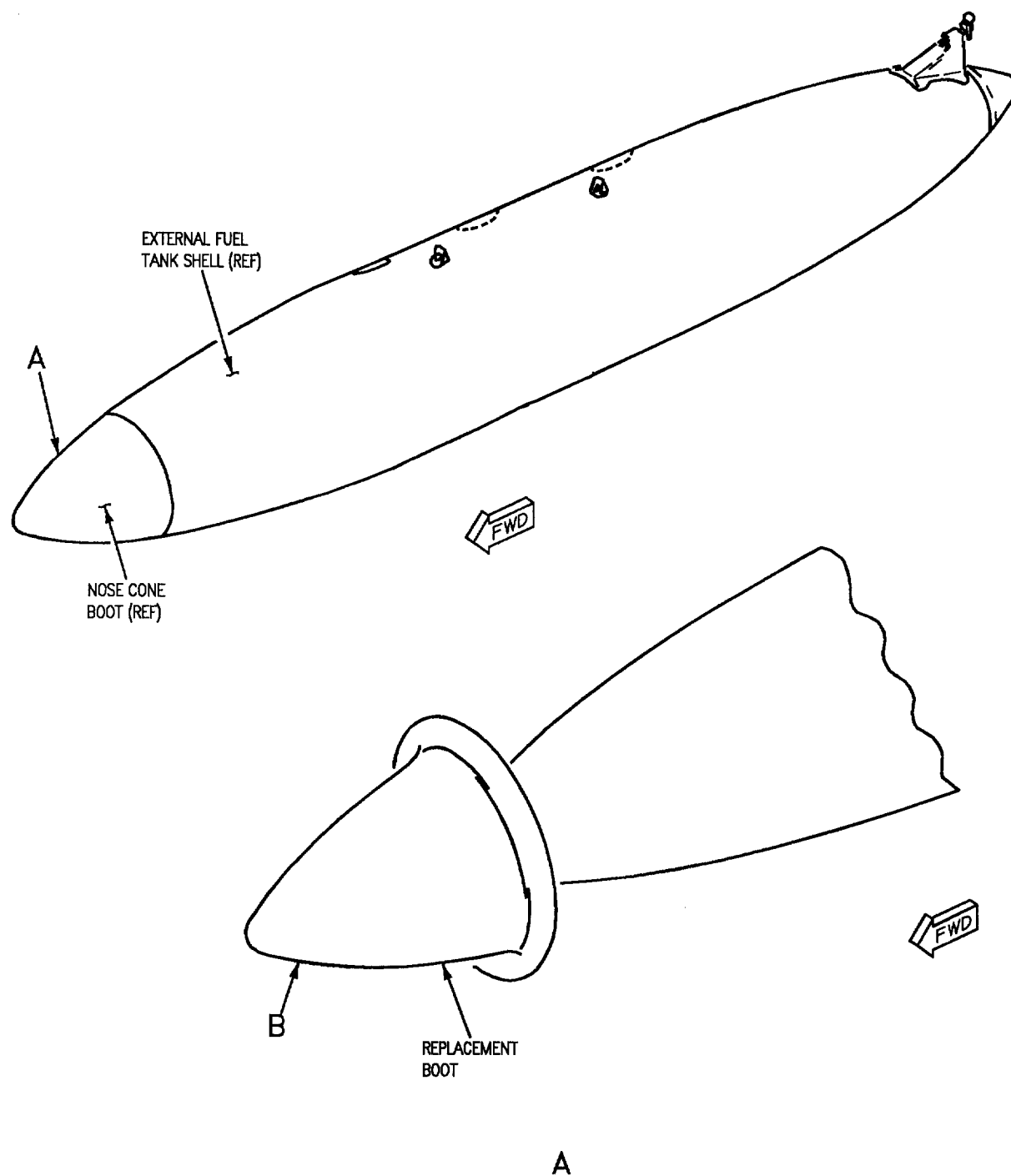
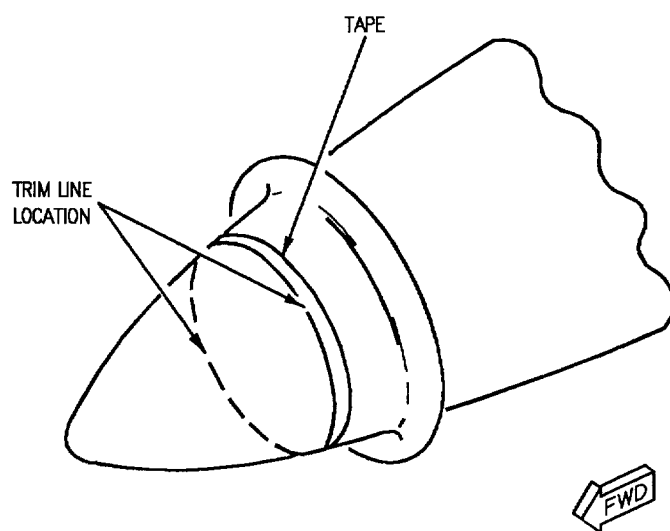


Figure 12. Nose Cone Boot Replacement (Sheet 1)



B

Figure 12. Nose Cone Boot Replacement (Sheet 2)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

EXTERNAL FUEL TANK, CYLINDRICAL, PART NO. 74A551000

SURVIVABILITY WRAP CLASS I THRU VII DAMAGE REPAIR

Reference Material

Aircraft Corrosion Control	A1-F18AC-SRM-500
Cylindrical External Fuel Tank, 74A551000, Finish System and Markings	WP046 00
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive Cement and Sealant; Preparation and Application	WP011 00
Structure Repair, Typical Repair	A1-F18AC-SRM-250
Curing of Repairs	WP004 00
Aluminum, Graphite Epoxy, or Titanium Patch Installation and Removal	WP007 00

Alphabetical Index

Subject	Page No.
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Class III Damage Repair	5
Class IV Damage Repair	7
Class V Damage Repair	10
Class VI Damage Repair	13
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Record of Applicable Technical Directives

None

1. CLASS I DAMAGE REPAIR.

Materials Required

2. This procedure is applicable to damage into or throughout the surface finish.

Nomenclature

Specification
or Part Number

Support Equipment Required

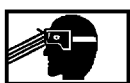
None

Isopropyl Alcohol
Paper, Abrasive
Rymple Cloth

TT-I-735, Grade 1
A-A-1047, Grit 240
AMS-3819



Isopropyl Alcohol



4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

- a. Wipe damaged area with clean rymple cloth dampened with isopropyl alcohol.
- b. Lightly sand the damaged area using abrasive paper.
- c. Wipe area with clean dry rymple cloth.
- d. Replace finish (A1-F18AC-SRM-500, WP046 00).

3. **CLASS II DAMAGE REPAIR.** See figure 1.

4. This procedure is applicable to damage into or through the surface ply.

Support Equipment Required

None

Materials Required

Specification or Part Number	Nomenclature
Adhesive	EA956
Brush, Varnish	H-B-695 Type 1, Grade A, Size 1 1/2
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
	Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Scraper, Sealant, 45	-
Cutting Edge, Phenolic (Micarta or Formica)	
Tape, Pressure Sensitive	855-1.000

a. Mask surface around damage area with pressure sensitive tape.



Isopropyl Alcohol



4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

- b. Clean unmasked area using clean rymple cloth moistened with isopropyl alcohol.
- c. Clean out damaged area using a sealant scraper, X-acto knife, and/or 180 grit abrasive paper.
- d. Make sure all damaged material has been removed by wiping area with clean dry rymple cloth.
- e. Rough sand damaged surfaces with 180 grit abrasive paper.
- f. Wipe dry with clean dry rymple cloth.



Adhesive

19

g. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

h. Apply one or more coats of adhesive to fill in and level the surface.

i. Cover with plastic sheet and work out any trapped air using a roller or squeegee.

j. Cure adhesive (A1-F18AC-SRM-250, WP004 00).

k. After cure, lightly sand damaged area with 240 grit abrasive paper.

l. Wipe area with clean dry rymple cloth.

m. Replace finish (A1-F18AC-SRM-500, WP046 00).

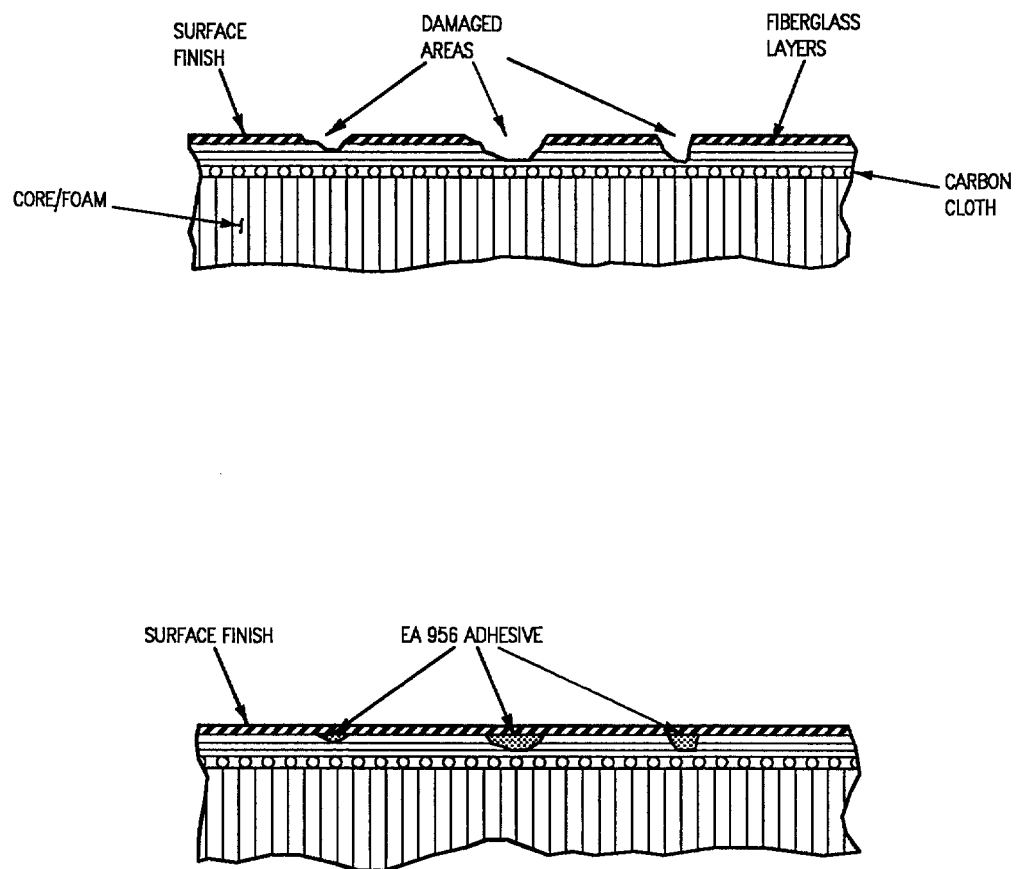


Figure 1. Class II Damage Repair

5. **CLASS III DAMAGE REPAIR.** See figure 2.

6. This procedure is applicable to small area damage to surface plies down to the carbon cloth layer.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Brush, Varnish	H-B-695 Type 1, Grade A, Size 1 1/2
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180 Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Scraper, Sealant, 45° Cutting Edge, Phenolic (Micarta or Formica)	-
Tape, Pressure Sensitive	855-1.000

a. Mask surface around damage area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Clean unmasked area using clean rymple cloth moistened with isopropyl alcohol.



Do not damage carbon cloth layer. Limit depth of router step c, or drill, step e, to prevent damage to carbon cloth.

c. Clean out damaged area using a router bit, X-acto knife, sealant scraper, and/or 180 grit abrasive paper.

d. Make sure all damaged material has been removed by wiping area with clean dry rymple cloth.

e. If damage is a crack with sharp edges, stop drill, through the outer fiberglass plies, at each end of the crack. Taper damaged area to get a slope of about 45 to 60 degrees using a No. 40 drill bit.

f. Wipe clean with clean, dry rymple cloth.



Adhesive

19

g. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

h. Apply coats of adhesive to fill in and level the surface.

i. Cover with tedlar film and work out any trapped air and excess adhesive using a roller or squeegee.

j. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

k. After cure, lightly sand damaged area with 240 grit abrasive paper.

l. Wipe area with clean dry rymple cloth.

m. Replace finish (A1-F18AC-SRM-500, WP046 00).

7. **CLASS IV DAMAGE REPAIR.** See figure 3.

8. This repair applies to large area damage to surface plies down to the carbon cloth layer.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Brush, Varnish	H-B-695 Type 1, Grade A, Size 1 1/2
Cloth, Satin	MIL-C-9084, Type 8, Class 2
Cloth, Teflon	TEMP-R-GLAS 3TLL
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180 Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

a. Mask surface around damage area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

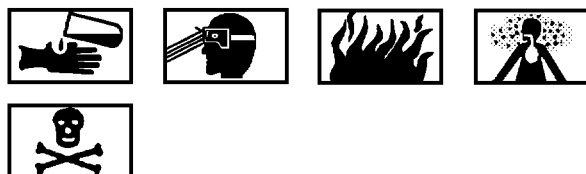
b. Clean unmasked area using clean rymple cloth moistened with isopropyl alcohol.



Do not route or sand into the carbon layer beneath the damaged laminate layers to avoid possible damage underneath.

c. Clean out damaged area using a router with controlled cutting depth. Sand smooth with 180 grit abrasive paper.

d. Wipe with clean dry rymple cloth.



Adhesive

19

e. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

f. Saturate a large piece of glass fabric breather cloth with adhesive.

g. Put tedlar film on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

h. Cut three plies of glass fabric breather cloth saturated with adhesive to exact fit.

i. Place the saturated glass fabric breather cloth in repair area.

j. Cover this layup with one layer of porous release fabric, teflon coated.

k. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

l. After cure, sand smooth and flush with surface with 180 grit abrasive paper. Remove all traces of finish within 2.5 inches of repair hole.

m. Wipe with clean dry rymple cloth.

n. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

o. Saturate a large piece of glass fabric breather cloth with adhesive.

p. Put tedlar film on both sides of glass fabric and work out air bubbles using a roller or squeegee.

q. Cut three plies of saturated glass fabric breather cloth to the size indicated. The bottom ply

shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply by a minimum of 0.12 inch (0.25 inch small in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

r. Paint repair surface with a thin layer of adhesive. Overlay repair with the three layers of glass fabric breather cloth saturated with adhesive.

s. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

t. After cure, remove the tedlar film and sand the stepped edges of glass fabric patches to a smooth contour with 240 grit abrasive paper.

u. Wipe area with clean, dry rymple cloth.

v. Replace finish (A1-F18AC-SRM-500, WP046 00).

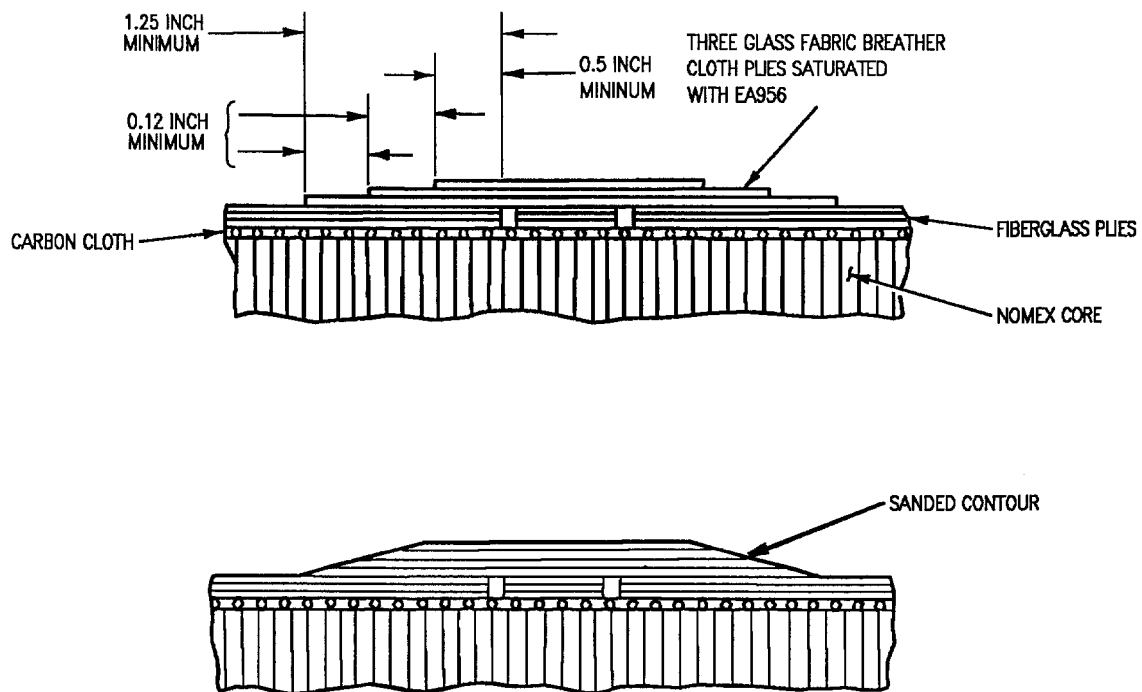
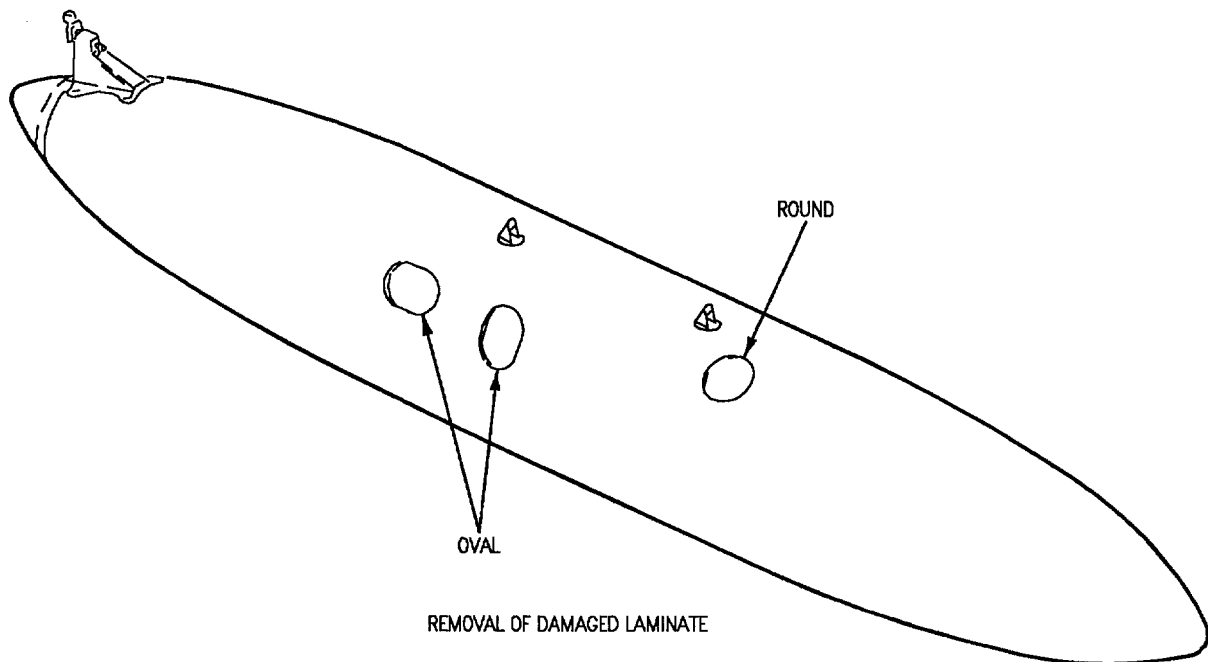


Figure 3. Class IV Damage Repair

9. **CLASS V DAMAGE REPAIR.** See figure 4.

10. This repair describes procedures for replacing damaged core with EA9231A/B adhesive and bonding repair with three plies of glass fabric, breather cloth saturated with EA956 adhesive.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA9321A/B
Adhesive	EA956
Cloth, Satin	MIL-C-9084, Type 8, Class 2
Cloth, Teflon	TEMP-R-GLAS 3TLL
Gloves, Chemical	ZZ-G-381, Type 1, Style 1
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
	Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

NOTE

No more than three Class V Damage Repairs are allowed per tank.

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth moistened with isopropyl alcohol.

c. Cut out the damaged outer skin only. Remove only enough material to remove sharp edges or corners.

d. Vacuum clean repair area.

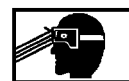


To prevent more damage, avoid sanding into base material when removing finish.

e. Complete surface preparation using 180 grit abrasive paper.

f. Vacuum sanding dust from repair area. Wipe surface clean with dry rymple cloth.

g. Dry repair area. Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).



Adhesive

2

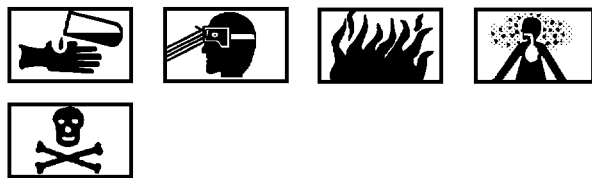
h. Prepare EA9321A/B adhesive (A1-F18AC-SRM-200, WP011 00).

i. Fill void with adhesive using a spatula. Work thoroughly into void air pockets. Trowel level with the surface. Add excess EA9321A/B adhesive to allow for shrinkage.

j. Place one ply of porous release fabric, teflon coated, over repair area.

k. Cure EA9321A/B adhesive (A1-F18AC-SRM-250, WP004 00).

l. Sand repair flush with tank surface.



Adhesive

19

m. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

n. Saturate a large piece of glass fabric breather cloth with EA956 adhesive.

o. Put tedlar film on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

p. Cut three plies of saturated glass fabric breather cloth to the size required. The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply by a minimum

of 0.12 inch (.25 inch smaller in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

q. Paint repair surface with a thin layer of EA956 adhesive. Overlay the repair with the three layers of glass fabric breather cloth plies saturated with EA956 adhesive.

r. Cover layup with one layer of porous release fabric, teflon coated.

s. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

t. After cure, remove the tedlar film and sand the stepped edges of glass fabric patches to a smooth contour with 240 grit abrasive paper.

u. Wipe area with clean, dry rymple cloth.

v. Replace finish (A1-F18AC-SRM-500, WP046 00).

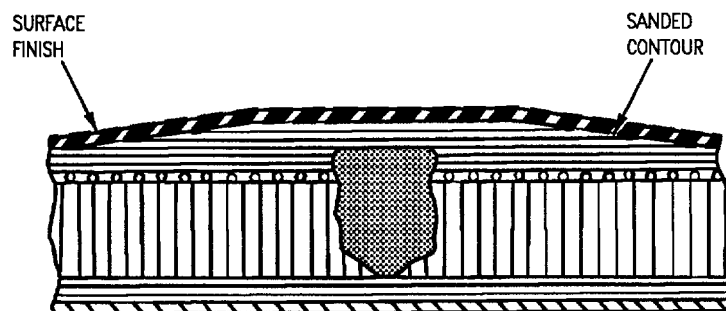
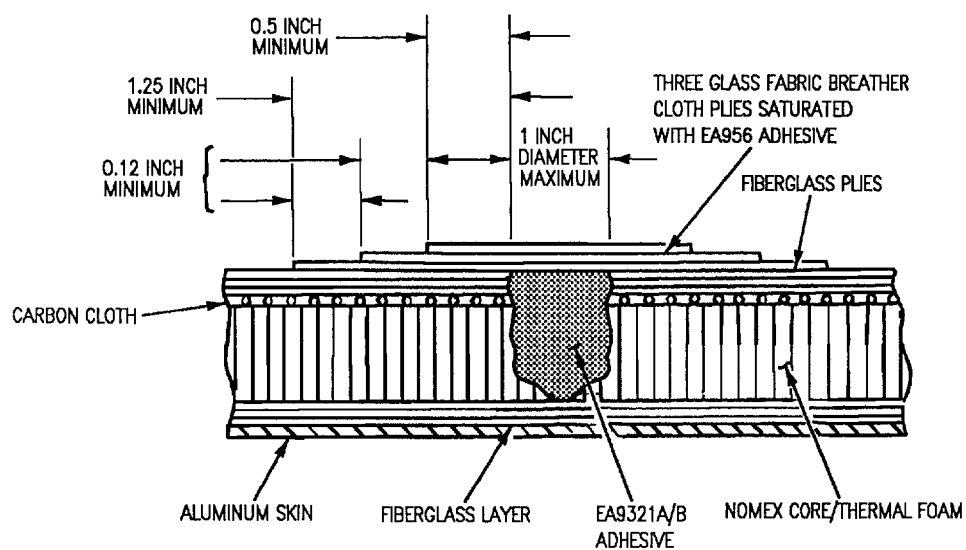


Figure 4. Class V Damage Repair

11. **CLASS VI DAMAGE REPAIR.** See figure 5.

12. This repair describes procedures for dent repair with EA9321A/B adhesive fill and patch repair of glass fabric breather cloth saturated with EA956 adhesive.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA9321A/B
Adhesive	EA956
Cloth, Satin	MIL-C-9084, Type 8, Class 2
Cloth, Teflon	TEMP-R-GLAS 3TLL
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
	Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4

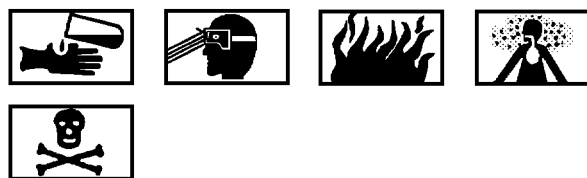


To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth moistened with isopropyl alcohol.

c. Complete surface preparation with 180 grit abrasive paper.

d. Wipe surface clean with clean, dry rymple cloth.



Adhesive

2

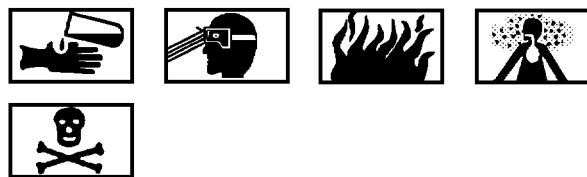
e. Prepare EA9321A/B adhesive (A1-F18AC-SRM-200, WP011 00).

f. Fill dented area with EA9321A/B adhesive.

g. Position one ply of porous release fabric, teflon coated, over the repair area.

h. Cure EA9321A/B adhesive (A1-F18AC-SRM-250, WP004 00).

i. Sand repair flush with surface.



Adhesive

19

j. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

k. Saturate a large piece of glass fabric breather cloth with EA956 adhesive.

l. Put tedlar film on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

m. Cut three plies of saturated glass fabric breather cloth to the size required. The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply by a minimum of 0.12 inch (0.25 inch smaller in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

n. Paint repair surface with a thin layer of EA956 adhesive. Overlay the repair with the three layers of glass fabric breather cloth plies saturated with EA956 adhesive.

o. Cover layup with one layer of porous release fabric, teflon coated.

p. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

q. After cure, remove the tedlar film and sand the stepped edges of glass fabric patches to a smooth contour with 240 grit abrasive paper.

r. Wipe area with clean, dry rymple cloth.

s. Replace finish (A1-F18AC-SRM-500, WP046 00).

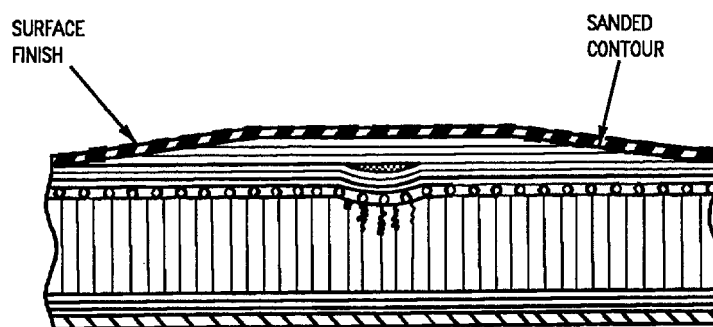
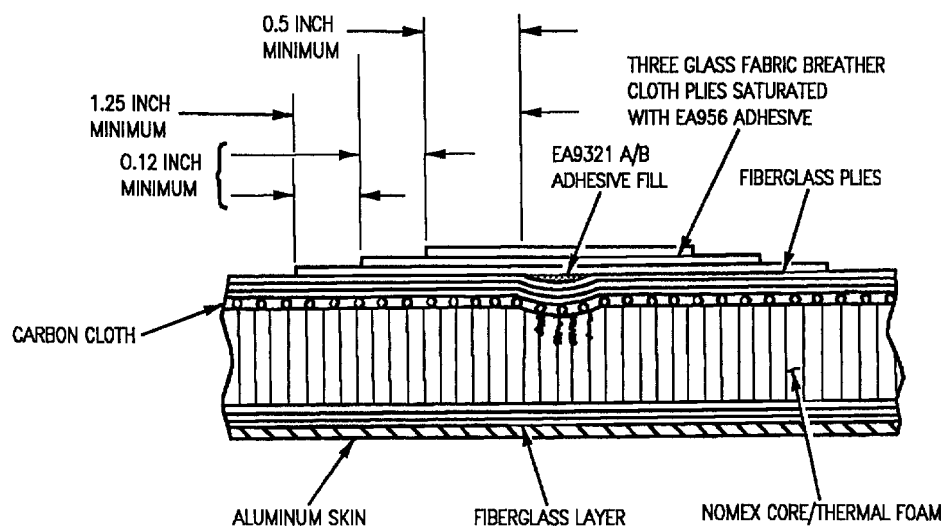


Figure 5. Class VI Damage Repair

13. **CLASS VII DAMAGE REPAIR.** See figure 6.

14. This procedure describes the replacement of core and splice of carbon cloth and glass fabric breather cloth plies.

Support Equipment Required

None

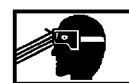
Materials Required

NOTE

Alternate item specifications or part numbers are shown indented.

Nomenclature	Specification or Part Number
Adhesive	EA956
Annealed Copper	QQ-C-576, 0.020 Inch Thick
Core Material, Over-expanded Nomex Core, 0.250 Inch Thick	MMS-715, Type 3
Dry Woven Graphite Cloth, Satin Weave	MMS-544
Glass Fabric, Breather Cloth	MIL-C-9084, Type 8, Class 2
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Plastic Sheet	Grit 240
Rymple Cloth	200SG40TR
Steel Music Wire	AMS-3819
Tape, Pressure Sensitive	QQ-W-470, 0.040 Inch Thick
Thermal Insulation	855-1.000
	Trymer CPR9501

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

c. Cut out the damaged outer skin only. Remove only enough material to remove sharp edges or corners.

d. Vacuum clean repair area.



To prevent more damage, avoid sanding into base material when removing finish.

e. Remove damaged nomex core using router, X-acto knife, and chisel.

f. Complete surface preparation using 180 grit abrasive paper.

g. Vacuum sanding dust from repair area. Wipe surface clean with dry rymple cloth.

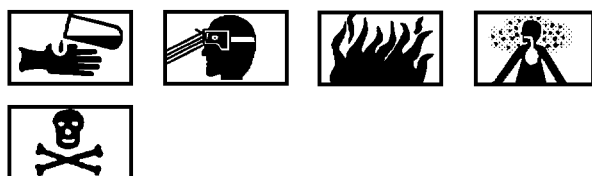
h. Dry repair area Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).

i. Cut nomex core smaller than diameter of damage. See Table 1.

Table 1. Damage Diameter vs Core Diameter

Damage Diameter (Inches)	Subtractive Factor (Inch)
0-2	0
2-4	0.05
4-8	0.08
8-12	0.12

Core Diameter = Damage Diameter - Subtractive Factor



Adhesive

19

j. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

k. Spread a layer of adhesive over bottom repair surface and exposed overexpanded nomex core using a small brush.

l. Spread adhesive on one side and periphery of overexpanded nomex core plug.

NOTE

The overexpanded nomex core should be placed so as to give the best overexpanded nomex core cell flexibility to conform to tank curvature.

m. Center overexpanded nomex core into repair area. Place overexpanded nomex core into repair with the adhesive-covered side down.

n. Cut thermal insulation to same diameter as the overexpanded nomex core.

o. Insert the overexpanded nomex core with thermal insulation using a roller. Roll the thermal insulation into the core by working from the center out to the edges.

p. Fill any peripheral voids with adhesive.

q. Position a copper sheet (add weights if necessary) over the repair to hold it in place. Cut notches in the sheet to aid in fitting the contoured tank surface.

NOTE

To facilitate notching the copper sheet to fit contour of external fuel tank, see detail

A. Position paper, or similar material, over the tank contour. Fold the material to cause it to conform to the tank surface. Use folded material as a pattern for notching the copper sheet.

r. Saturate a large layer of unimpregnated carbon cloth with adhesive. The unimpregnated carbon cloth shall be large enough to cut into two pieces, one the size of the overexpanded nomex core and another to overlap the overexpanded nomex core by a minimum 1/2-inch.

s. Put plastic sheet on both sides of unimpregnated carbon cloth and work out air bubbles using a roller or squeegee.

t. Cut unimpregnated carbon cloth to size of overexpanded nomex core plug (orientation not important).

u. Remove copper sheet from repair.

v. Position saturated unimpregnated carbon cloth over core.

NOTE

Orient the wire in the hoop direction at approximately 1 inch spacing. A minimum of one wire per inch of damage opening in the longitudinal direction is required.

w. Trap the repair with steel music wire inserted into the adjacent core a minimum of 1 inch using lock wire pliers.

x. Cut another saturated unimpregnated carbon cloth to overlap the overexpanded nomex core plug and initial unimpregnated carbon cloth by a minimum of 1/2-inch.

y. Overlay the saturated unimpregnated carbon cloth on the repair.

z. Saturate a large piece of glass fabric breather cloth with adhesive.

aa. Put plastic sheet on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

ab. Cut two plies of saturated glass fabric breather cloth to splice into the repair.

ac. Overlay the saturated glass fabric breather cloth plies on the repair.

ad. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

ae. Sand repair to smooth finish. Remove tank finish 2.5 inches from edge of damage.

af. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

ag. Saturate a large piece of glass fabric breather cloth with adhesive.

ah. Put plastic sheet on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

NOTE

The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply a minimum of 0.12 inch (0.25 inch small in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

ai. Cut three plies of saturated glass fabric breather cloth to the size required.

aj. Paint repair surface with a thin layer of adhesive. Overlay repair with the three layers of glass fabric breather cloth plies saturated with adhesive.

ak. Cure EA596 adhesive (A1-F18AC-SRM-250, WP004 00).

al. After cure, remove the plastic sheet and sand the stepped edges of glass fabric patches to a smooth contour with 240 grit abrasive paper.

am. Wipe area with clean, dry rymple cloth.

an. Replace finish (A1-F18AC-SRM-500, WP046 00).

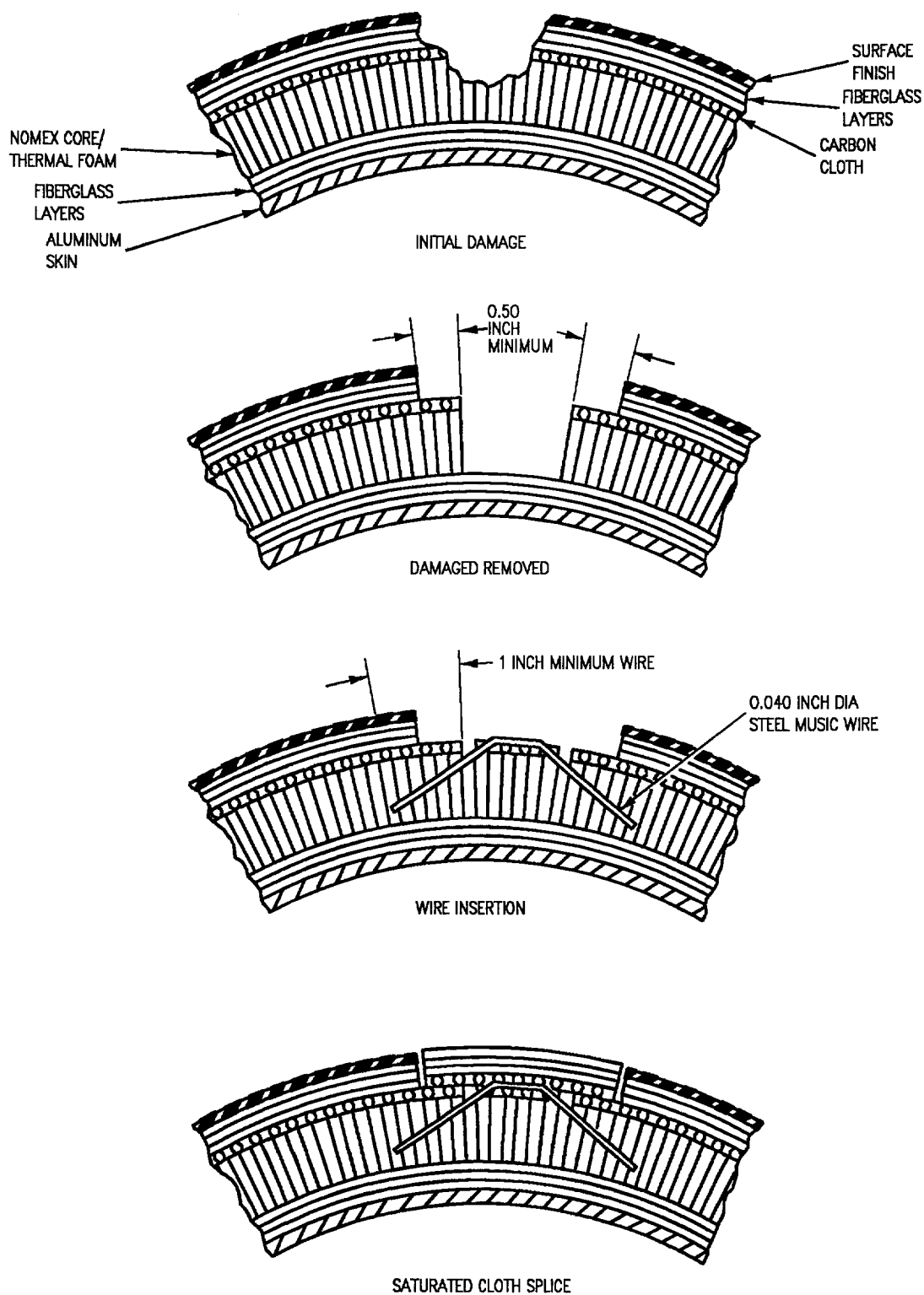


Figure 6. Class VII Damage Repair (Sheet 1)

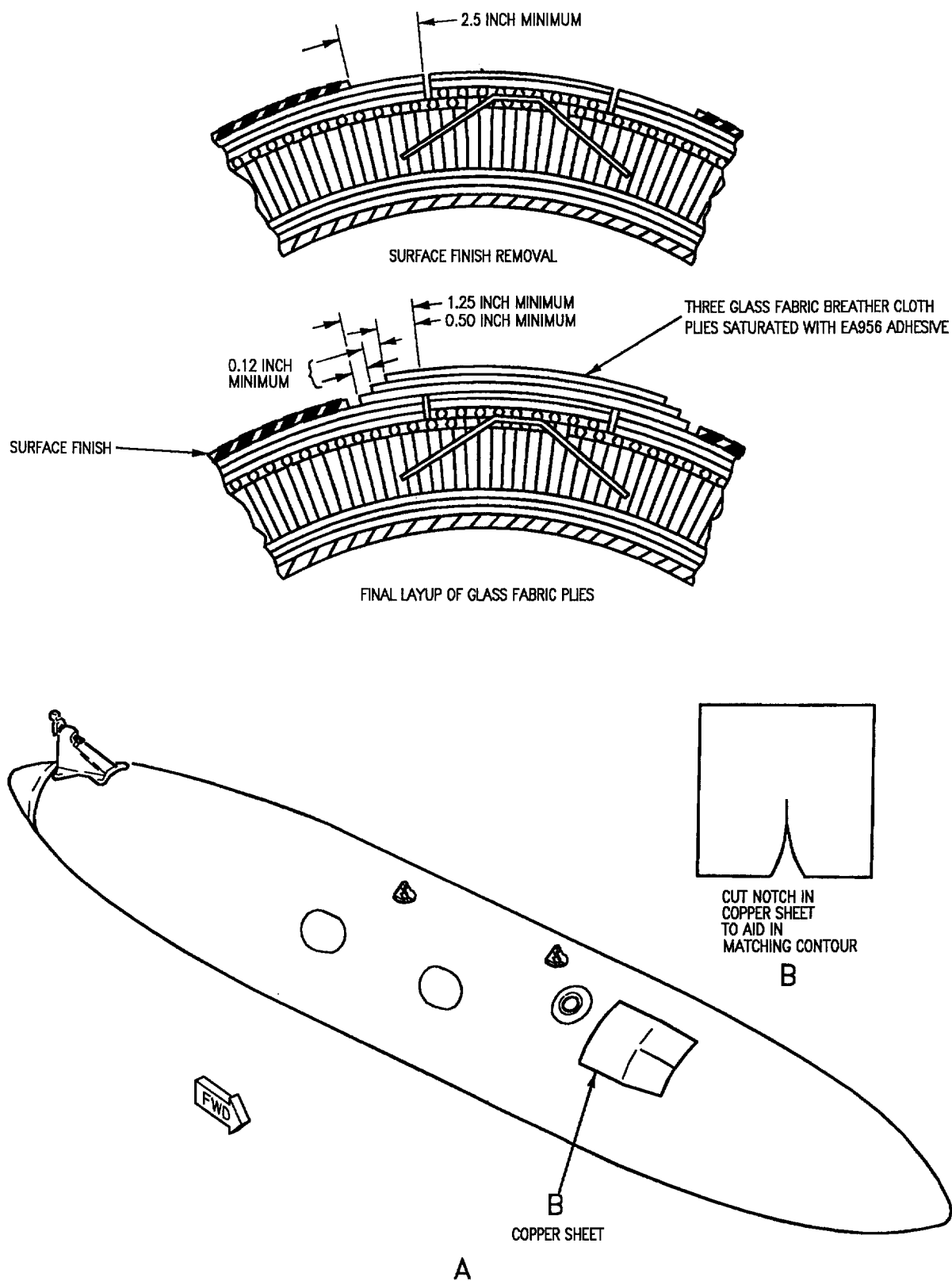


Figure 6. Class VII Damage Repair (Sheet 2)

ORGANIZATIONAL MAINTENANCE

STRUCTURAL REPAIR

EXTERNAL FUEL TANK, CYLINDRICAL, PART NO. 74A551000

SURVIVABILITY WRAP CLASS VIII THRU X DAMAGE REPAIRS

Reference Material

Aircraft Corrosion Control	A1-F18AC-SRM-500
Cylindrical External Fuel Tank, 74A551000, Finish System and Markings	WP046 00
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Structure Repair, Typical Repair	A1-F18AC-SRM-250
Curing of Repairs	WP004 00
Aluminum, Graphite Epoxy, or Titanium Patch Installation and Removal	WP007 00
Aircraft Weapons Systems Cleaning and Corrosion Control	NAVAIR 01-1A-509

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Torque Values for Graphite Epoxy Hole Defect Repair Clamp-Up Bolts	12
Vacuum Impregnation for Delamination at Fastener Hole	9
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Record of Applicable Technical Directives

None

1. **CLASS VIII DAMAGE REPAIR.** See figure 1.

2. The procedures below describe repair to the fiberglass layer beneath damaged core.

Support Equipment Required

None

Materials Required

NOTE

Alternate item specifications or part numbers are shown indented.

Materials Required (Continued)

Nomenclature	Specification or Part Number
Adhesive	EA956
Annealed Copper Cloth, Satin	QQ-C-576, 0.020 Inch Thick MIL-C-9084, Type 8, Class 2
Core Material, Over- expanded Nomex Core, 0.240 Inch Thick	MMS-715, Type 3
Dry Woven Graphite Cloth, Satin Weave	MMS-544
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol Paper, Abrasive	TT-I-735, Grade 1 A-A-1047, Grit 180 Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Steel Music Wire	QQ-W-470, 0.040 Inch Thick
Tape, Pressure Sensitive	855-1.000
Thermal Insulation	Trymer CPR9501
Thermal Insulation	Themarest 5152

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

c. Remove material from damaged area using a router bit, X-acto knife, chisel, and 180 grit abrasive paper. Remove damage to a circular or oval shape.

d. Vacuum clean the repair area.



Be careful not to damage aluminum shell.

e. Sand exposed metal tank surface with 180 grit abrasive paper and wipe with clean dry rymple cloth.

f. Dry repair area, Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).



Adhesive

19

g. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP0011 00).

h. Saturate a large piece of glass fabric breather cloth with adhesive.

i. Put tedlar film on both sides of glass fabric and work out air bubbles using a roller or squeegee.

j. Measure diameter of repair area at aluminum skin surface, if less than 1 inch, do substep (1). If diameter of repair area at aluminum skin surface is more than or equal to 1 inch, do substep (2).

(1) Cut three plies of saturated glass fabric breather cloth to fill in repair area. Coat the aluminum surface with adhesive. Overlay the plies on repair. Continue with step k.

(2) Cut three plies of saturated glass fabric breather cloth with a minimum overlap of 0.25 inch each with a combined splice overlap of 0.75 inch minimum. Coat the aluminum surface with adhesive. Overlay the plies on repair.

k. Cut overexpanded nomex core smaller than diameter of damage. See table 1.

Table 1. Damage Diameter vs Core Diameter

Damage Diameter (Inches)	Subtractive Factor (Inch)
0-2	0
2-4	0.05
4-8	0.08
8-12	0.12

Core Diameter = Damage Diameter - Subtractive Factor

l. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

m. Spread a layer of adhesive over bottom repair surface and exposed overexpanded nomex core using a small brush.

n. Spread adhesive on one side and periphery of overexpanded nomex core plug.

NOTE

The overexpanded nomex core should be placed so as to give the best overexpanded nomex core cell flexibility to conform to tank curvature.

o. Center overexpanded nomex core into repair area. Place overexpanded nomex core into repair with the adhesive-covered side down.

p. Cut thermal insulation to the same diameter as the overexpanded nomex core.

q. Insert the overexpanded nomex core with thermal insulation using a roller. Roll the thermal insulation into the core by working from the center out to the edges.

r. Fill any peripheral voids with adhesive.

s. Position a copper sheet (add weights if necessary) over the repair to hold it in place. Cut notches in the sheet to aid in fitting to the contoured tank surface.

NOTE

To facilitate notching the copper sheet to fit the contour of external fuel tank, see figure 1, detail A. Position paper, or similar material, over the tank contour. Fold the material to cause it to conform to the tank surface. Use folded material as a pattern for notching copper sheet.

t. Saturate a large layer of carbon cloth with adhesive. The carbon cloth shall be large enough to cut into two pieces, one the size of the overexpanded nomex core and another to overlap the overexpanded nomex core by a minimum 1/2-inch.

u. Put plastic sheet on both sides of carbon cloth and work out air bubble using a roller or squeegee.

v. Cut carbon cloth to size of overexpanded nomex core plug (orientation not important).

w. Remove copper sheet from repair.

x. Position saturated carbon cloth over core.

NOTE

Orient the wire in the hoop direction at approximately 1 inch spacing. A minimum of one wire per inch of damage opening in the longitudinal direction is required.

y. Trap the repair with steel music wire inserted into the adjacent core a minimum of 1 inch using lock wire pliers.

z. Cut another piece of saturated carbon cloth to overlap the overexpanded nomex core plug and initial carbon cloth by a minimum of 1/2-inch.

aa. Overlay the saturated carbon cloth on the repair.

ab. Saturate a large piece of glass fabric breather cloth with adhesive.

ac. Put plastic sheet on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

ad. Cut two plies of saturated glass fabric breather cloth to splice into the repair.

ae. Overlay the saturated glass fabric breather cloth plies on the repair.

af. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

ag. Sand repair to smooth finish. Remove tank finish 2.5 inches from edge of damage.

ah. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

ai. Saturate a large piece of glass fabric breather cloth with adhesive.

aj. Put plastic sheet on both sides of glass fabric breather cloth and workout air bubbles using a roller or squeegee.

NOTE

The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply a minimum of 0.12 inch (0.25 inch small in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

ak. Cut three plies of saturated glass fabric breather cloth.

al. Paint repair surface with a thin layer of adhesive. Overlay the repair with the three layers of glass fabric breather cloth plies saturated with adhesive.

am. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

an. After cure, sand the stepped edges of fiberglass patches to a smooth contour with 240 grit abrasive paper.

ao. Wipe area with clean, dry rymple cloth.

ap. Replace finish (A1-F18AC-SRM-500, WP046 00).

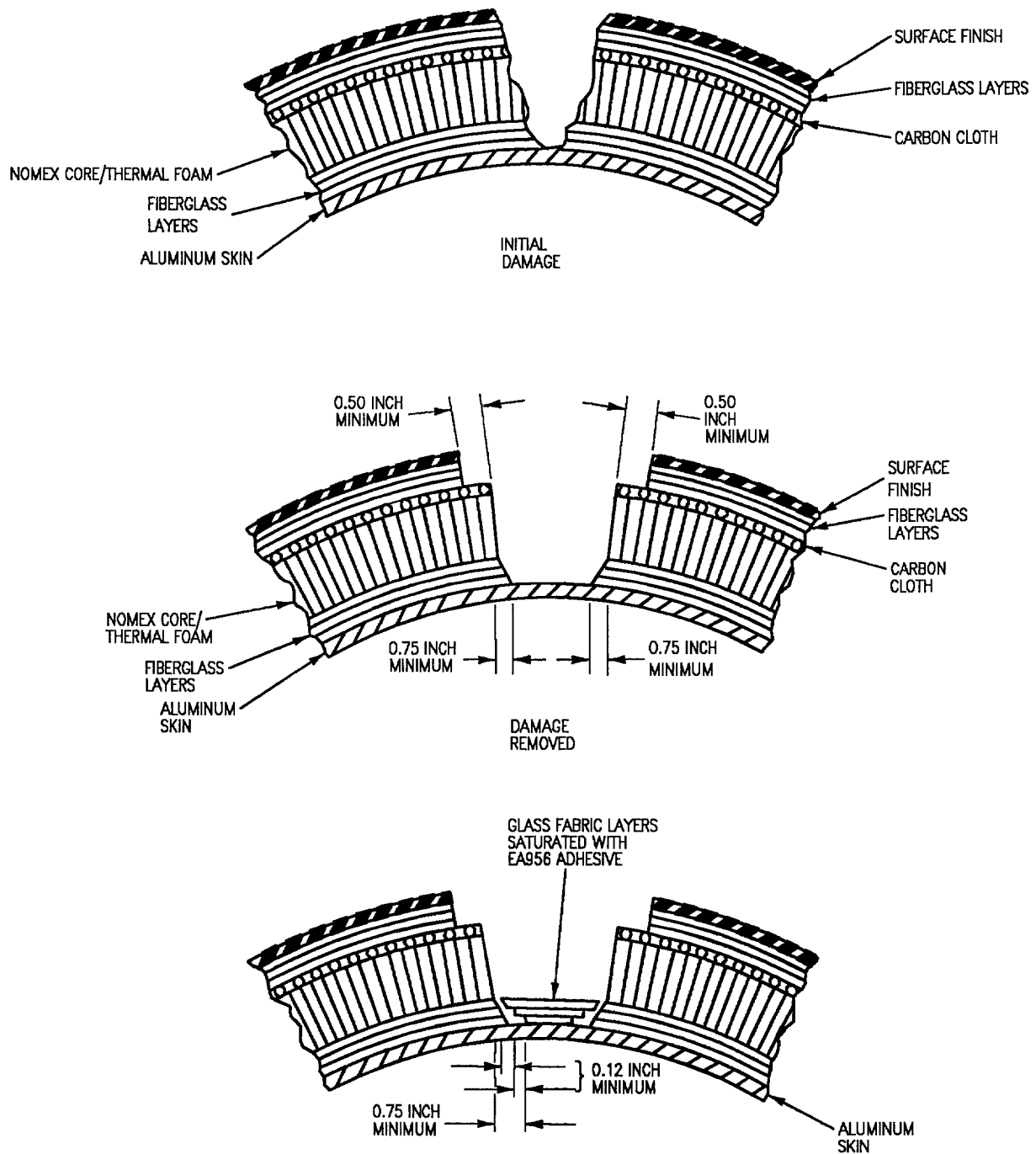


Figure 1. Class VIII Damage Repair (Sheet 1)

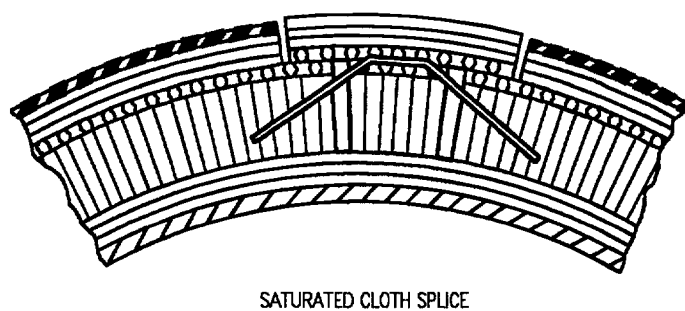
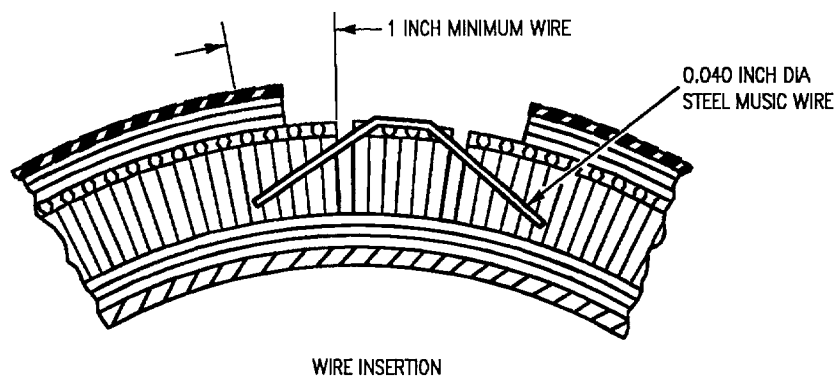


Figure 1. Class VIII Damage Repair (Sheet 2)

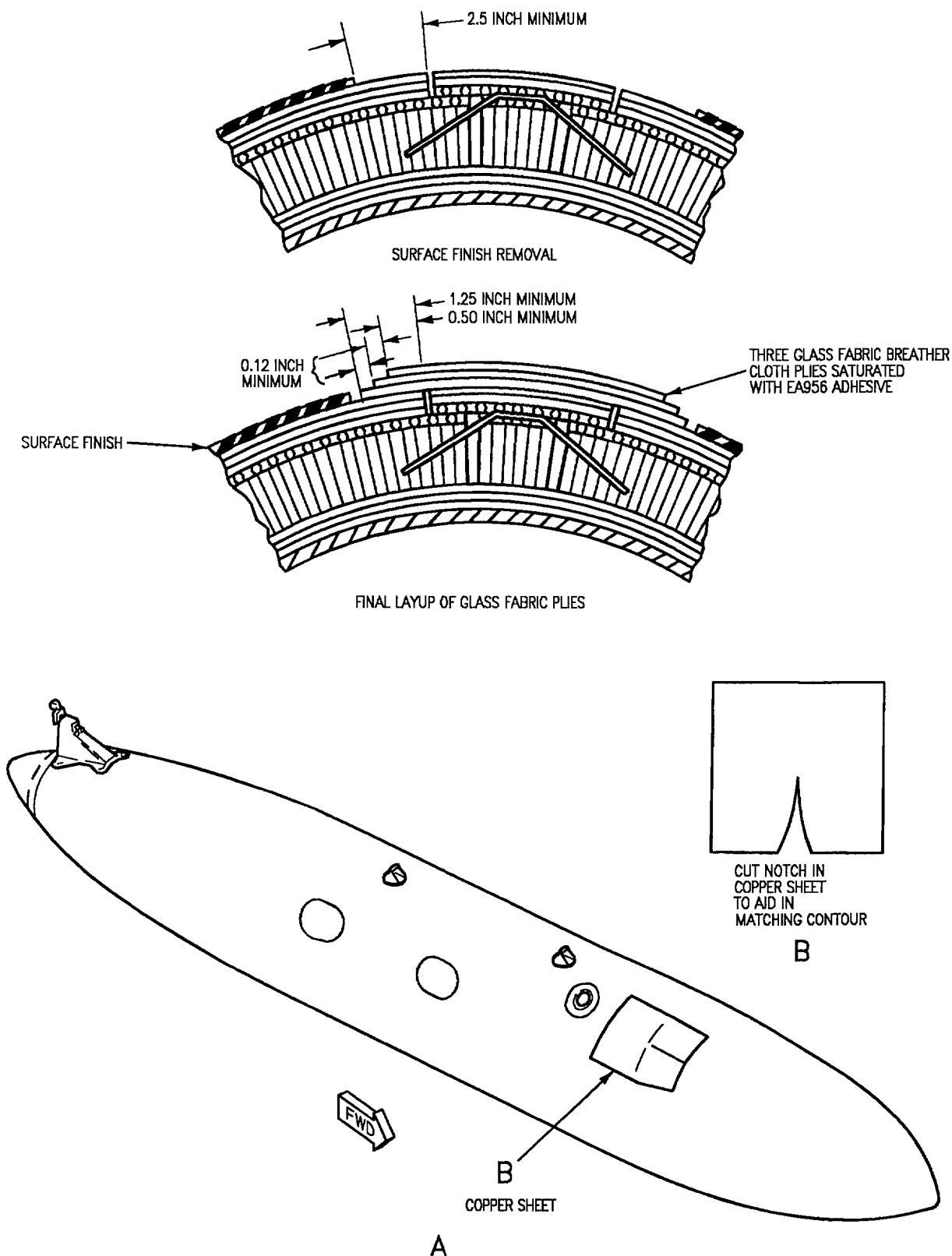


Figure 1. Class VIII Damage Repair (Sheet 3)

3. **CLASS IX DAMAGE REPAIR.** See figure 2.

4. This work package gives procedures for repair of damage to inserts in the solid laminate. Included are procedures for edge damage, edge delamination at the fastener hole.

5. **EDGE DAMAGE.** See section A.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA9321A/B
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
	Grit 240
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000
Tape, Vacuum Bag Sealant	9151-1-500

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

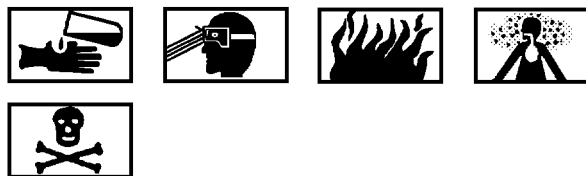


Use caution not to damage adjacent structure while removing damaged material.

c. Remove damaged material with a router. Use 180 grit abrasive paper to finish preparation of repair area.

d. Wipe the area clean with clean dry rymple cloth.

e. Block off the repair to the dimension desired. Prepare dam of sealant tape as needed.



Adhesive

2

f. Prepare EA9321A/B adhesive (A1-F18AC-SRM-200, WP0011 00).

g. Fill repair with adhesive using a small putty knife.

h. Cure EA9321A/B adhesive (A1-F18AC-SRM-250, WP004 00).

i. Lightly sand repaired area using 240 grit abrasive paper.

j. Wipe area with clean dry rymple cloth.

k. Replace finish (A1-F18AC-SRM-500, WP046 00).

6. EDGE DELAMINATION. See figure 2, section B.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Air Pressure Gage, 0 to 50 psi	-
Metal Backup Plate (2 Required)	1/8 Inch Thick, Size as Required to Cover Repair
Sealant Gun	Number 250
Weights, for Stacking (Amount as Required to Apply 5 Pounds per Square Inch of Repair Area)	-

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Nozzle, Sealant Gun	420
Paper, Abrasive	A-A-1047, Grit 240
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

a. Tape separated edges of damaged area, keeping a small opening at each end.



Adhesive

19

b. Prepare adhesive (A1-F18AC-SRM-200, WP0011 00).

c. Inject adhesive at 40 psi, using a sealant gun and nozzle, into one opening until it flows from the other opening. Allow adhesive to flow until clear.

d. Wipe off excess adhesive with clean dry rymple cloth.

e. Cover both openings with pressure sensitive tape.

f. Apply pressure to repair using weights and backup plates.

g. Cure adhesive (A1-F18AC-SRM-250, WP004 00).

h. Remove weights backup plates and tape.



Be careful not to sand into laminates. Sanding into surface of material will cause damage.

i. Sand repair area smooth using abrasive paper.

j. Wipe area with clean dry rymple cloth.

k. Replace finish (A1-F18AC-SRM-500, WP046 00).

7. VACUUM IMPREGNATION FOR DELAMINATION AT FASTENER HOLE. See figure 2, section C.

NOTE

This method is valid only for those cases in which delamination is restricted to carbon laminate and does not extend to core.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Heat Gun	-
Lexan Plate or Vacuum Chamber	-
Thermocouple	-
Torque Wrench	-
Vacuum Gage, 0 to 30 inch	-
Vacuum Pump, Hose, and Fittings	-

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Lubricant, Fluorocarbon	MS-122
Metal Plate	-
Paper, Abrasive	A-A-1047, Grit 240
Rymple Cloth	AMS-3819
Tape, Vacuum Bag Sealant	9151-1-500

a. Using section C of figure 2 as a guide, get a metal plate and aluminum ring of the size required. Use Table 2 to get the correct size temporary fastener and washer.



Fluorocarbon Lubricant

20

b. Coat all the items in step (a) with teflon release agent in an area away from the repair. Allow release agent to dry thoroughly before bringing these parts near the repair site.

c. Use sealant tape to attach the metal plate to one side of the skin per Section C. Place the aluminum ring around the hole as shown.

d. Form a dam of sealant tape around the hole as shown in section C to form a reservoir for extra adhesive.

e. Apply sealant tape to the lexan vacuum chamber and seal the assembly shown in Section C. Apply vacuum of 24 to 29 inches of mercury and check for leaks.

f. If leaks are found, discontinue vacuum, adjust or add more sealant, and reapply vacuum. Again check for leaks. Repeat this step until there are no leaks.



Adhesive

19

g. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

h. Remove the lexan vacuum chamber from assembly and heat the skin around the hole to 150°F using a heat gun and thermocouple. Hold at 150°F for 10 minutes.

i. Remove heat gun and fill the hole and reservoir with adhesive.

j. Attach the lexan vacuum chamber to the assembly and apply 24 to 29 inches of mercury vacuum.

k. Continue applying vacuum for 5 minutes. Then vent the assembly to the atmosphere. Add more adhesive if necessary, then reseal the lexan vacuum chamber and apply vacuum for 5 more minutes.

l. Vent the assembly and remove the metal plate, aluminum ring, lexan vacuum chamber, and all sealant and extra adhesive from skin.

m. Place temporary fastener through the hole with a washer on each side of skin. Tighten fastener to the torque specified in Table 2 using a torque wrench.

n. Cure adhesive (A1-F18AC-SRM-250, WP004 00).

o. Remove fastener and clean up all excess adhesive.

p. Lightly sand repaired area using abrasive paper.

q. Wipe area with clean dry rymple cloth.

r. Replace finish (A1-F18AC-SRM-500, WP046 00).

8. POSITIVE PRESSURE INJECTION FOR DELAMINATION. See figure 2, section D.

NOTE

This procedure may be used for cases in which the delamination or unbond is open to the core.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Cartridges, Sealant Gun	250-CP-2-1/2
Isopropyl Alcohol	TT-I-735, Grade 1

Materials Required (Continued)

Nomenclature	Part Number or Type Designation
Paper, Abrasive	A-A-1047, Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Nozzle, Sealant Gun	420
Tape, Pressure Sensitive	855-1.000
Tubing, 1/2 Inch Surgical, Rubber, or Plastic	-



Isopropyl Alcohol



4



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

a. Wipe repair area with clean rymple cloth moistened with isopropyl alcohol.

b. Drill 1/8-inch diameter holes at each end of the delamination or unbond. Minimum spacing between holes is 1/2-inch for damage 1 inch or less. Do not drill closer than 1/2-inch from adjacent fastener or edge of part. For delaminations or unbonds between 1 inch and 5 inches in diameter, drill 1/8-inch diameter holes at 1 inch spacing around perimeter of damage.

c. Make sure holes are located within the delaminations or unbonds:

(1) Fit sealing nozzles into the holes at each end of the delamination or unbond. Tape over intermediate holes with pressure sensitive tape.

(2) Attach a piece of tubing to one nozzle and submerge the other end in a container of water.

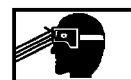
(3) Attach other nozzle to sealant gun cartridge without plunger and place cartridge in sealant gun. Attach a regulated source of compressed air to sealant gun.

(4) Apply pressure with air regulator set for 40 psi through the sealant gun into the delamination or unbond.

(5) Check water for bubbles to make sure air flow exists. If air flow exists, go to step d. If air flow does not exist, do steps b and c.

d. Remove nozzle from holes.

e. Tape the separated edges of damaged area, using pressure sensitive tape, completely covering the opening.



Adhesive

19

f. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

g. Fill the delaminations or unbonds with adhesive:

(1) Inject adhesive at 40 psi, using a sealant gun and nozzle, into one hole and fill until adhesive flows clear from other hole. For delaminations or unbonds with more than two holes, inject adhesive into each hole until adhesive flows clear from all holes.

(2) Wipe off excess adhesive with clean dry rymple cloth.

h. Cover adhesive with tedlar film and cure repair (A1-F18AC-SRM-250, W004 00).

i. Remove tedlar film and pressure sensitive tape.

j. Lightly sand repaired area using abrasive paper.

k. Wipe area with clean dry rymple cloth.

l. Replace finish (A1-F18AC-SRM-500, WP046 00).

Table 2. Torque Values For GR/EP Hole Defect Repair Clamp-Up Bolts

Requirements

S Use Ti or CRES Hex Head Bolts

S Washer OD shall be large enough to extend a minimum of 0.06 inch beyond defect

Torque Values

<u>Diameter of Defective Hole</u>	<u>Clamp-Up Bolt Size</u>	<u>Torque Value - Max</u>
3/16	# 8-36	6.5 inch-lbs
1/4	# 10-32	7.5
5/16	1/4-28	10
3/8	5/16-24	12.5
7/16	3/8-24	15.5
1/2	7/16-20	18

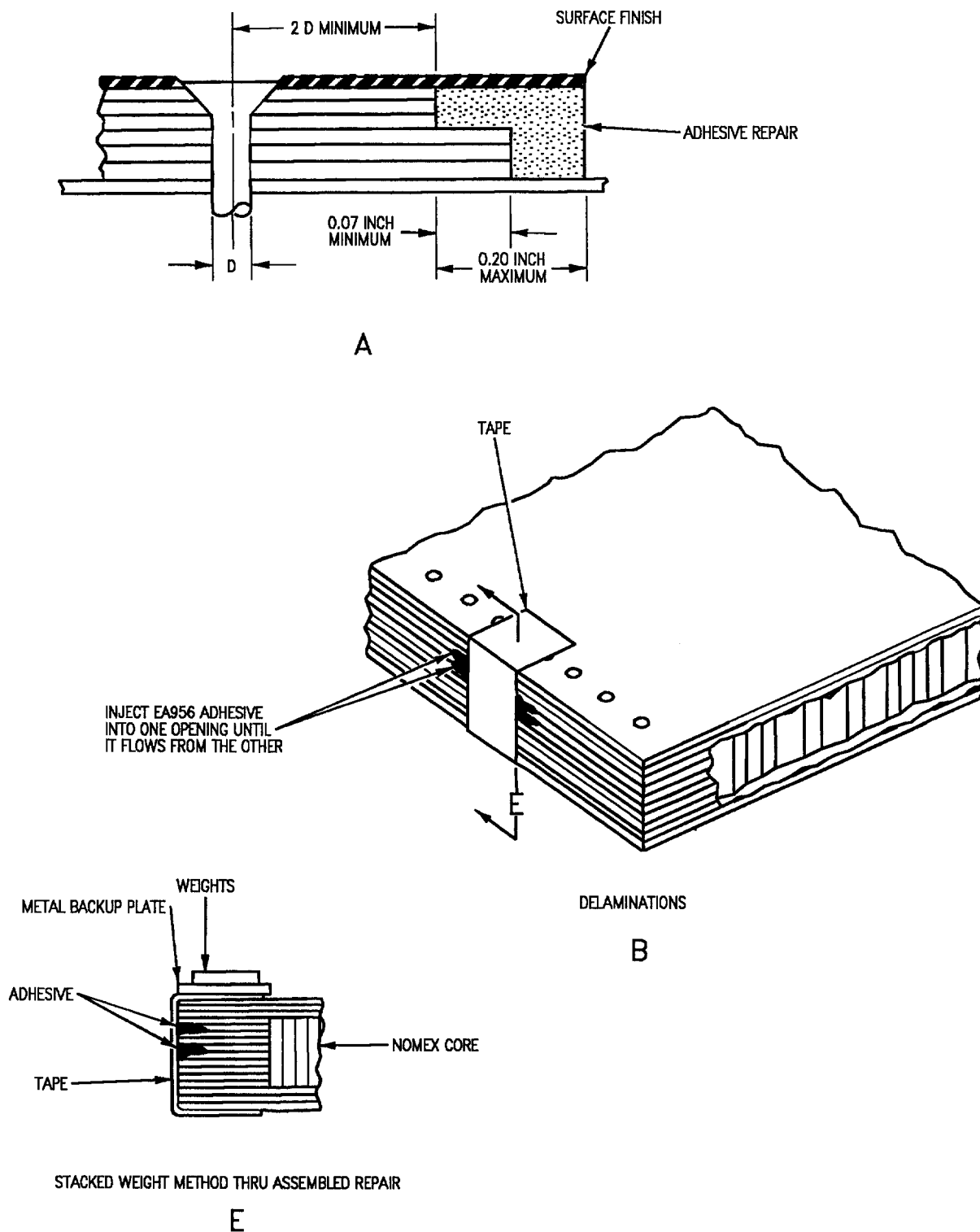


Figure 2. Class IX Damage Repair (Sheet 1)

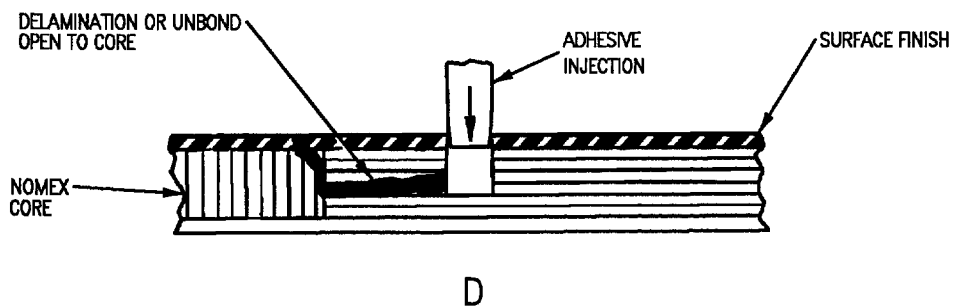
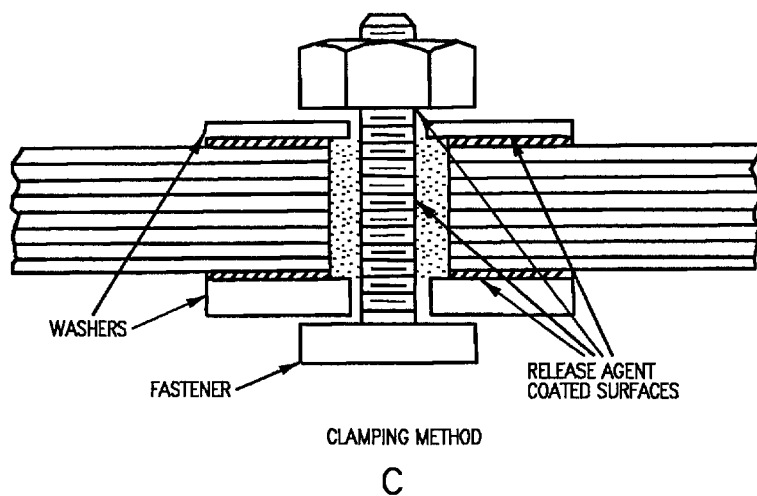
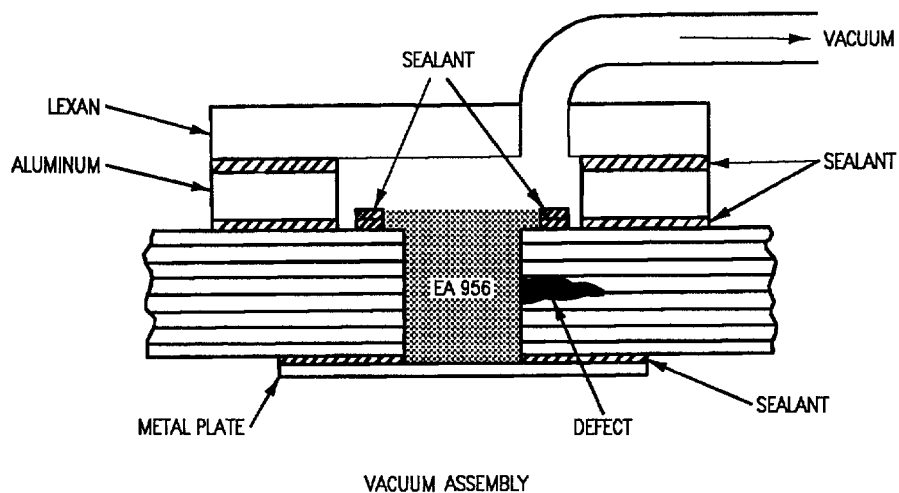


Figure 2. Class IX Damage Repair (Sheet 2)

9. **CLASS X DAMAGE REPAIR.** See figure 3.

10. This procedure describes repair of corroded aluminum skin.

Support Equipment Required

None

Materials Required

NOTE

Alternate item specifications or part numbers are shown indented.

Nomenclature	Specification or Part Number
Adhesive	EA956
Annealed Copper Cloth, Satin	QQ-C-576, 0.020 Inch Thick
Core Material, Over-expanded Nomex Core, 0.240 Inch Thick	MIL-C-9084, Type 8, Class 2
Dry Woven Graphite Cloth, Satin Weave	MMS-715, Type 3
Gloves, Cotton Work, Men's	MMS-544
Isopropyl Alcohol	MIL-G-3866, Type 1
Paper, Abrasive	TT-I-735, Grade 1
	A-A-1047, Grit 180
	Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Steel Music Wire	QQ-W-470, 0.040 Inch Thick
Tape, Pressure Sensitive	855-1.000
Thermal Insulation	Trymer CPR9501

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth moistened with isopropyl alcohol.

c. Remove material from damaged area using a router bit, X-acto knife, chisel, and 180 grit abrasive paper. Remove damage to a circular or oval shape.

d. Vacuum clean the repair area.



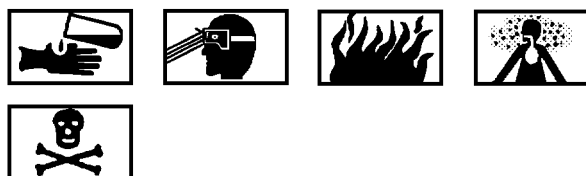
Be careful not to cause more damage to the aluminum shell when removing corrosion.

e. Remove aluminum skin corrosion (NAVAIR 01-1A-509).

f. Clean area with clean dry rymple cloth.

g. Verify that the remaining thickness is more than or equal to 80 percent of the initial thickness.

h. Dry repair area, Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).



Adhesive

19

i. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

j. Saturate a large piece of glass fabric breather cloth with adhesive.

k. Put plastic sheet on both sides and work out the air bubbles using a roller or squeegee.

l. Measure diameter of repair area at aluminum skin surface, if less than 1 inch, do substep (1). If

diameter of repair area at aluminum skin surface is more than or equal to 1 inch, do substep (2).

(1) Cut three plies of saturated glass fabric breather cloth to fill in repair area. Coat the aluminum surface with adhesive. Overlay the plies on repair. Continue with step m.

(2) Cut three plies of saturated glass fabric breather cloth with a minimum overlap of 0.25 inch each with a combined splice overlap of 0.75 inch minimum. Coat the aluminum surface with adhesive. Overlay the plies on the repair.

m. Cut expanded nomex core smaller than diameter of damage. See table 3.

Table 3. Damage Diameter vs Core Diameter

Damage Diameter (Inches)	Subtractive Factor (Inch)
0-2	0
2-4	0.05
4-8	0.08
8-12	0.12

Core Diameter = Damage Diameter - Subtractive Factor

n. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

o. Spread a layer of adhesive over bottom repair surface and exposed overexpanded nomex core using a small brush.

p. Spread adhesive on one side and periphery of overexpanded nomex core plug.

NOTE

The overexpanded nomex core should be placed so as to give the best overexpanded nomex core cell flexibility to conform to tank curvature.

q. Center overexpanded nomex core into repair area. Place overexpanded nomex core into repair with the adhesive-covered side down.

r. Cut thermal insulation to the same diameter as the overexpanded nomex core.

s. Insert the overexpanded nomex core with thermal insulation using a roller. Roll the thermal insulation into the core by working from the center out to the edges.

t. Fill any peripheral voids with adhesive.

u. Position a copper sheet (add weights if necessary) over the repair to hold it in place. Cut notches in sheet to aid in fitting the contoured tank surface.

NOTE

To facilitate notching the copper sheet to fit the contour of external fuel tank, see figure 3, detail A. Position paper, or similar material, over the tank contour. Fold the material to cause it to conform to the tank surface. Use folded material as a pattern for notching copper sheet.

v. Saturate a large layer of carbon cloth with adhesive. The carbon cloth shall be large enough to cut into two pieces, one the size of the overexpanded nomex core and another to overlap the overexpanded nomex core by a minimum 1/2-inch.

w. Put plastic sheet on both sides and work out air bubbles using a roller or squeegee.

x. Cut carbon cloth to size of overexpanded nomex core plug (orientation not important).

y. Remove copper sheet from repair.

z. Position saturated carbon cloth over core.

NOTE

Orient the steel music wire in the hoop direction at approximately 1 inch spacing. A minimum of one steel music wire per inch of damage opening in the longitudinal direction is required.

aa. Trap the repair with steel music wire inserted into the adjacent core a minimum of 1 inch using lock wire pliers.

ab. Cut another saturated carbon cloth to overlap the overexpanded nomex core plug and initial carbon cloth by a minimum of 1/2-inch.

ac. Overlay the saturated carbon cloth on the repair.

ad. Saturate a large piece of glass fabric breather cloth with adhesive.

ae. Put plastic sheet on both sides of glass fabric and work out air bubbles using a roller or squeegee.

af. Cut two plies of saturated glass fabric breather cloth to splice into the repair.

ag. Overlay the saturated glass fabric breather cloth plies on the repair.

ah. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

ai. Sand repair to smooth finish. Remove tank finish 2.5 inches from edge of damage.

aj. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP0011 00).

ak. Saturate a large piece of glass fabric breather cloth with adhesive.

al. Put plastic sheet on both sides of glass fabric and work out air bubbles using a roller or squeegee.

NOTE

The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply a minimum of 0.12 inch (0.25 inch small in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

am. Cut three plies of saturated glass fabric breather cloth.

an. Paint repair surface with a thin layer of adhesive. Overlay repair with the three layers of glass fabric breather cloth plies saturated with adhesive.

ao. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

ap. After cure, sand the stepped edges of glass fabric patches to a smooth contour with 240 grit abrasive paper.

aq. Wipe area with clean, dry rymple cloth.

ar. Replace finish (A1-F18AC-SRM-500, WP046 00).

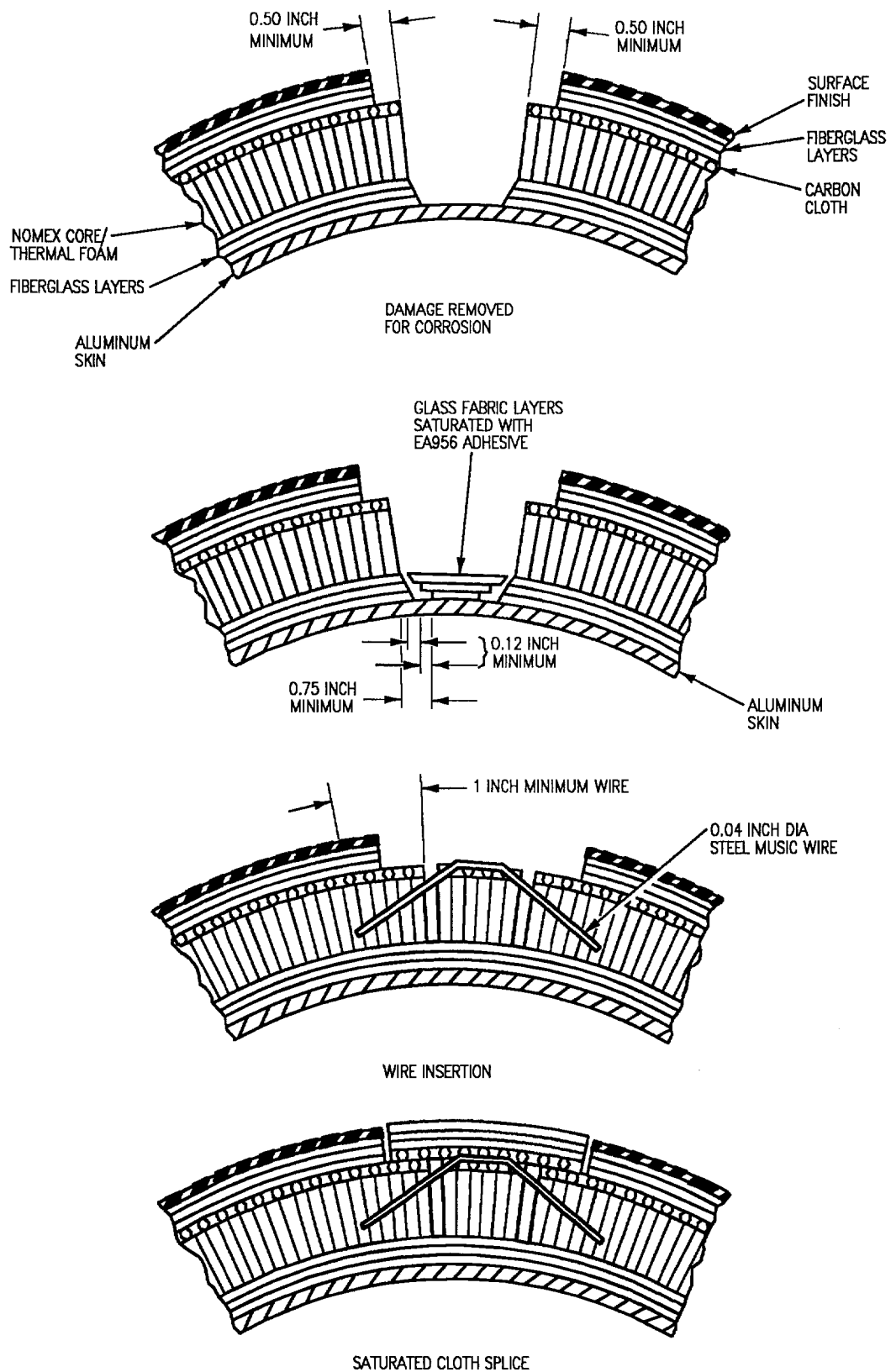


Figure 3. Class X Damage Repair (Sheet 1)

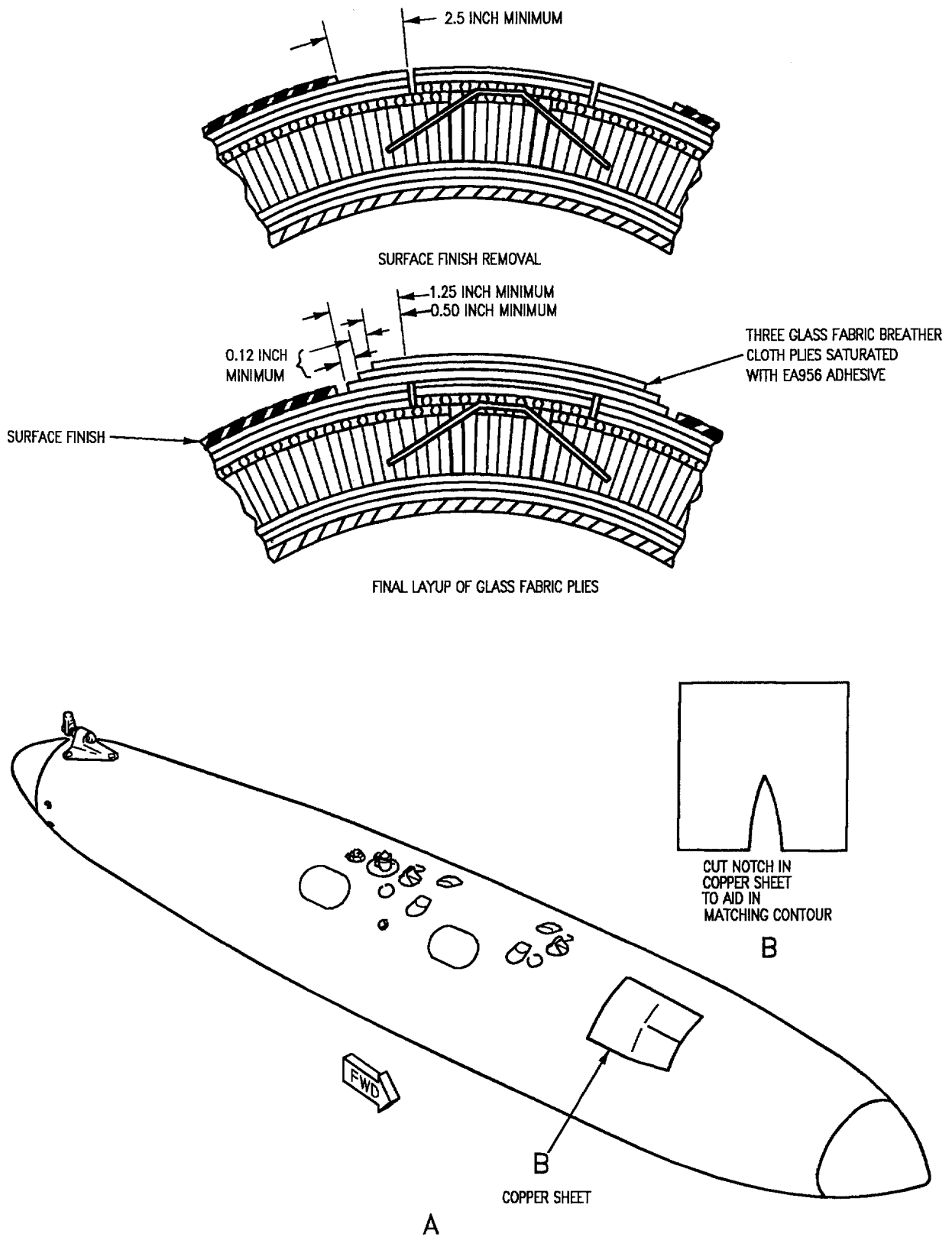


Figure 3. Class X Damage Repair (Sheet 2)

ORGANIZATIONAL AND INTERMEDIATE MAINTENANCE

STRUCTURE REPAIR

EXTERNAL FUEL TANK, CYLINDRICAL PART NO. 74A551000

METAL REPAIR

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
External Fuel Tank, Cylindrical, Part No. 74A551000	WP022 00
External Fuel Tank, Cylindrical, Part No. 74A551000	
Survivability Wrap Class VIII Thru X Damage Repairs	WP022 02
Airborne Weapons/Stores Loading Manual	A1-F18AC-LWS-000
Aircraft Corrosion Control	A1-F18AC-SRM-500
Cylindrical External Fuel Tank, 74A551000 Finish System and Markings	WP046 00
External Fuel Tank FPU-6A and FPU-8A, Part Numbers	
74A550000-1021 and 74A551000-1005	A1-471AC-460-030
External Fuel Tank FPU-8A, Fuel System Installation - Disassembly	WP010 00
External Fuel Tank FPU-8A, Fuel System Installation - Assembly	WP012 00
Fuel System	A1-F18AC-460-300
Ground Support Equipment	WP009 01
Fuel Tank Maintenance, Precautions and General Preparation	WP013 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Plane Captain Manual	A1-F18AC-PCM-000
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Structure Repair, Typical Repair	A1-F18AC-SRM-250
Curing of Repairs	WP004 00
Aluminum Patch Fabrication	WP006 01
Aluminum, Graphite Epoxy, or Titanium Patch Installation and Removal	WP007 00
Aircraft Fuel Cells and Internal/External Tanks	NAVAIR 01-1A-35
Engineering Series for Aircraft Repair	NAVAIR 01-1A-9

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Record of Applicable Technical Directives

None

1. REPAIR PROCEDURES.

2. Application of repair procedures one through six are specified by damage evaluation (WP022 00). Repair procedures that do not require welding are organizational maintenance and welding procedures are intermediate maintenance.

3. COMBUSTIBLE AND TOXIC GAS INDICATOR.

Materials Required

None

a. Set indicator (A1-F18AC-460-300, WP009 01).

b. To inspect for 20 percent of lower explosive limit set PPM/LEL switch to LEL (out) position.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Toxic and Combustible Gas Indicator	72-8001

c. To inspect for 5 percent of lower explosive limit set PPM/LEL switch to PPM (in) position.

4. PURGING PROCEDURES.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Apron, Utility	MIL-A-41829
Gloves, Chemical	ZZ-G-381, TYPE 1, STYLE 1

a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).

b. Ground fuel tank and purging equipment and air purge tank with facility air, changing positions occasionally to circulate air through all portions of tank (NAVAIR 01-1A-35).

c. Continue air purge circulation until the fuel/air concentration is less than 20 percent of the lower explosive limit as indicated on the indicator, per Combustible and Toxic Gas Indicator, this WP.

d. Remove doors 516 and 517 (A1-F18AC-LMM-010).

e. Remove tank fuel system components (A1-F18AC-460-030, WP010 00):

- (1) Fuel Level Control Pilot Valve.
- (2) Refuel/Transfer Shutoff Valve.
- (3) Manual Precheck Valve.
- (4) Fuel Quantity Transmitter.
- (5) Pressurization and Vent Valve.
- (6) Pressure Relief Valve.

f. Install doors 516 and 517 (A1-F18AC-LMM-010).



Make sure tank is correctly supported, weight of water could cause structural damage.

g. Attach a drain to air inlet and fill tank with water through the fuel inlet allowing water to overflow for a minimum of 5 minutes.

h. Drain water from tank.

i. Remove doors 516 and 517 (A1-F18AC-LMM-010).

WARNING

Steam will cause serious injury if not handled correctly. Wear rubber gloves, rubber apron and protective face shield. If steam burns eyes or skin, report to medical facility.

j. Direct steam into tank through access doors, directing steam on to as many of the internal surfaces as possible.

k. Continue steam cleaning until the fuel/air concentration is less than 5 percent of the lower explosive limit as indicated on the indicator, per Combustible and Toxic Gas Indicator, this WP.

5. REPAIR PROCEDURE ONE.

6. REMOVAL OF EXTERNAL FUEL TANK.

a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).

b. Defuel external fuel tank (A1-F18AC-PCM-000).

c. Drain residual fuel per substeps below:

(1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel



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WARNING

To prevent personal injury, do not stand directly under drain valve.

(2) Open drain valve.

(3) Close drain valve when residual fuel has drained.

d. Remove external fuel tank.

e. Purge external fuel tank until a safe indication is displayed on the indicator, per Combustible and Toxic Gas Indicator, and Purging Procedures, this WP.

7. REPAIRS. See figure 1.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

Nomenclature	Specification or Part Number
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before welding per purging procedures. Fuel presence while welding will cause fire and/or explosion.

a. Remove survivability wrap:

(1) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol



4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

(2) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

NOTE

Remove material so that a 2 inch clearance exists between wrap and damage on all sides.

(3) Remove damaged material using a router bit, X-acto knife, and abrasive paper.

(4) Vacuum clean repair area.

WARNING

Before welding, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Damage is repaired by welding (NAVAIR 01-1A-9).

c. Welding must be completed in one pass.

d. No heat treatment after welding.

e. Repairs must maintain contour smoothness.

f. Install doors 516 and 517 (A1-F18AC-LMM-010).

g. Leak test repairs, with the test set-air leakage, external fuel tank (1) per substeps below:

- (1) Fill tank with water.
- (2) Install adapter (3) on fuel/air coupling.
- (3) Install connector (2) to adapter (3).
- (4) Connect facility air to connector (2).
- (5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gage (4) from tank.

(10) Drain water from tank.

h. Remove doors 516 and 517 (A1-F18AC-LMM-010).

i. Install tank fuel system components (A1-471AC-460-030, WP012 00):

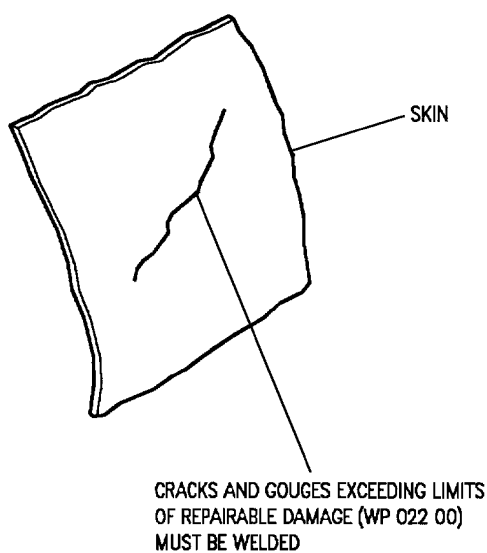
- (1) Pressure Relief Valve.
- (2) Pressurization and Vent Valve.
- (3) Fuel Quantity Transmitter.
- (4) Manual Precheck Valve.
- (5) Refuel/Transfer Shutoff Valve.
- (6) Fuel Level Control Pilot Valve.

j. Install doors 516 and 517 (A1-F18AC-LMM-010).

k. Replace survivability wrap per class VIII damage repair (WP022 02).

l. Refinish repaired areas (A1-F18AC-SRM-500, WP046 00).

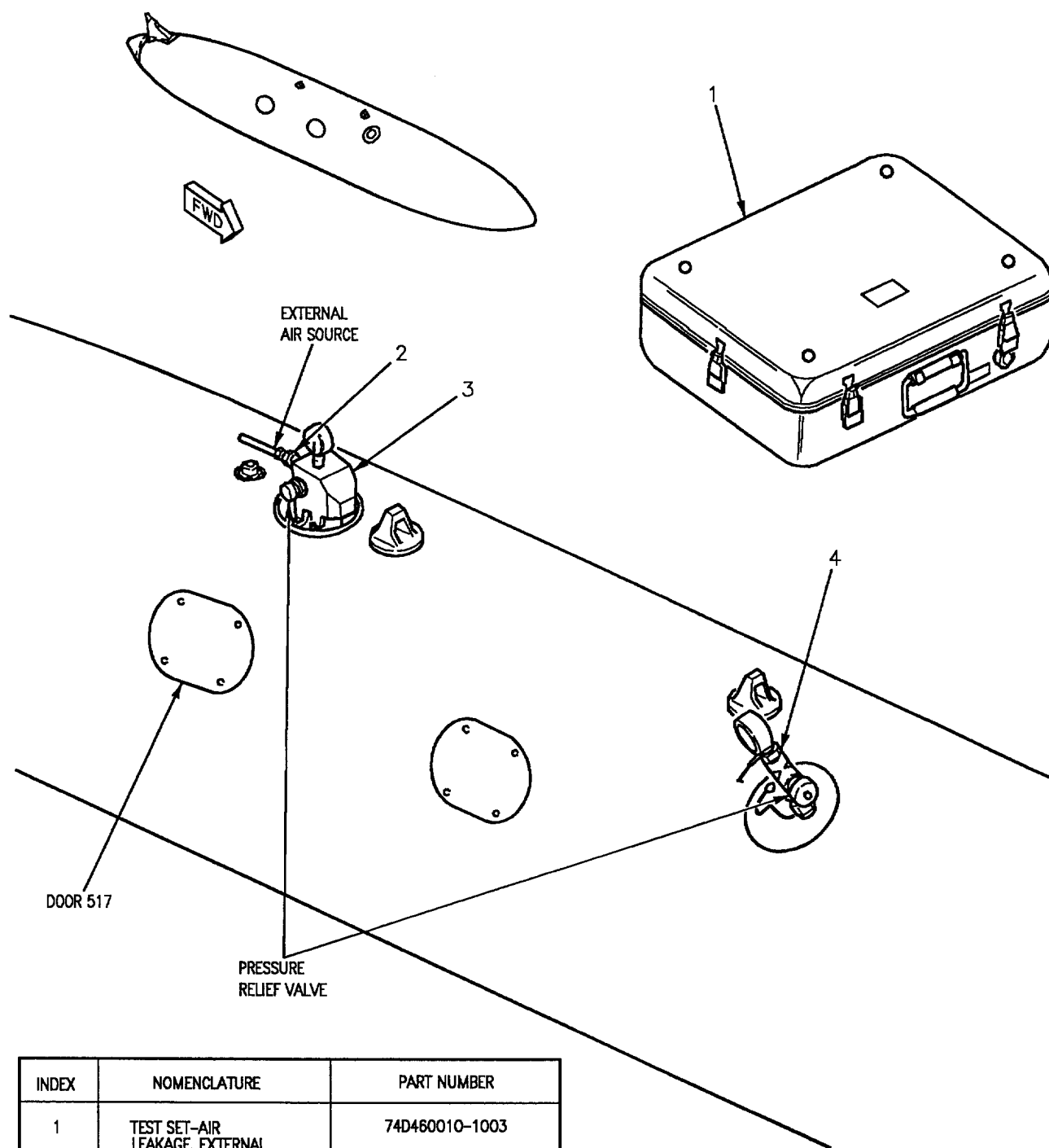
8. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).



LEGEND

CLEAN CRACK OR GOUGE THOROUGHLY BEFORE WELDING

Figure 1. Repair Procedure One (Sheet 1)



INDEX	NOMENCLATURE	PART NUMBER
1	TEST SET-AIR LEAKAGE, EXTERNAL FUEL TANK	74D460010-1003
2	CONNECTOR	74D461011-1029
3	ADAPTER	74D461011-1021
4	GAGE	74D461011-1013

Figure 1. Repair Procedure One (Sheet 2)

9. REPAIR PROCEDURE TWO.

10. REMOVAL OF EXTERNAL FUEL TANK.

- a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).
- b. Defuel external fuel tank (A1-F18AC-PCM-000).
- c. Drain residual fuel per substeps below:

(1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel



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WARNING

To prevent personal injury, do not stand directly under drain valve.

(2) Open drain valve.

(3) Close drain valve when residual fuel has drained.

d. Remove external fuel tank (A1-F18AC-LWS-000).

e. Purge external fuel tank until a safe indication is displayed on the indicator, per Combustible and Toxic Gas Indicator, and Purging Procedures, this WP.

11. REPAIRS. See figure 2.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

Nomenclature	Specification or Part Number
Aluminum Sheet, 4 Inch by 4 Inch	6061-T6, 0.063 Inch Thick

Materials Required (Continued)

Nomenclature	Specification or Part Number
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before welding per purging procedures. Fuel presence while welding will cause fire and/or explosion.

a. Remove survivability wrap:

(1) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4

CAUTION

To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

(2) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

NOTE

Remove material so 2 inch clearance exists between wrap and damage on all sides.

(3) Remove damaged material using router bit, X-acto knife, and abrasive paper. Remove damage to circular or oval shape.

(4) Vacuum clean repair area.

WARNING

Before welding, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Damage is repaired by welding (NAVAIR 01-1A-9).

c. Damage is repaired by a plug patch.

d. Remove damage to a circular or oval shape, which best fits the damage.

e. Limit repairs to substeps below:

(1) Plug patch material must be 6061-T6 aluminum alloy, 0.063 inch thick.

(2) Patches to be formed before welding.

(3) Welding must be completed in one pass.

(4) No heat treatment after welding.

(5) Repairs must maintain contour smoothness.

(6) Damage not to exceed 1.5 inches in diameter.

f. Install doors 516 and 517 (A1-F18AC-LMM-010).

g. Leak test repairs, with the test set-air leakage, external fuel tank (1) per substeps below:

(1) Fill tank with water.

(2) Install adapter (3) on fuel/air coupling.

(3) Install connector (2) to adapter (3).

(4) Connect facility air to connector (2).

(5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gauge (4) from tank.

(10) Drain water from tank.

h. Remove doors 516 and 517 (A1-F18AC-LMM-010).

i. Install tank fuel system components (A1-471AC-460-030, WP012 00):

(1) Pressure Relief Valve.

(2) Pressurization and Vent Valve.

(3) Fuel Quantity Transmitter.

(4) Manual Precheck Valve.

(5) Refuel/Transfer Shutoff Valve.

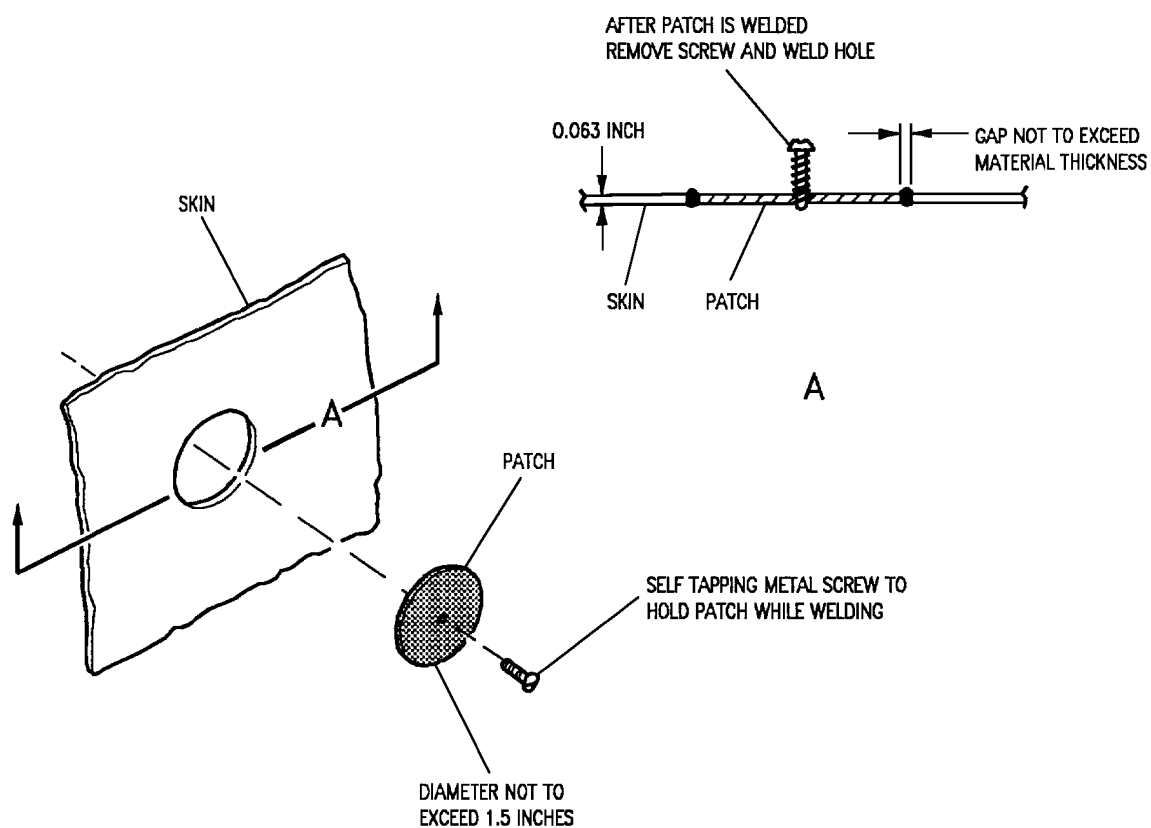
(6) Fuel Level Control Pilot Valve.

j. Install doors 516 and 517 (A1-F18AC-LMM-010).

k. Replace survivability wrap per class VIII damage repair (WP022 02).

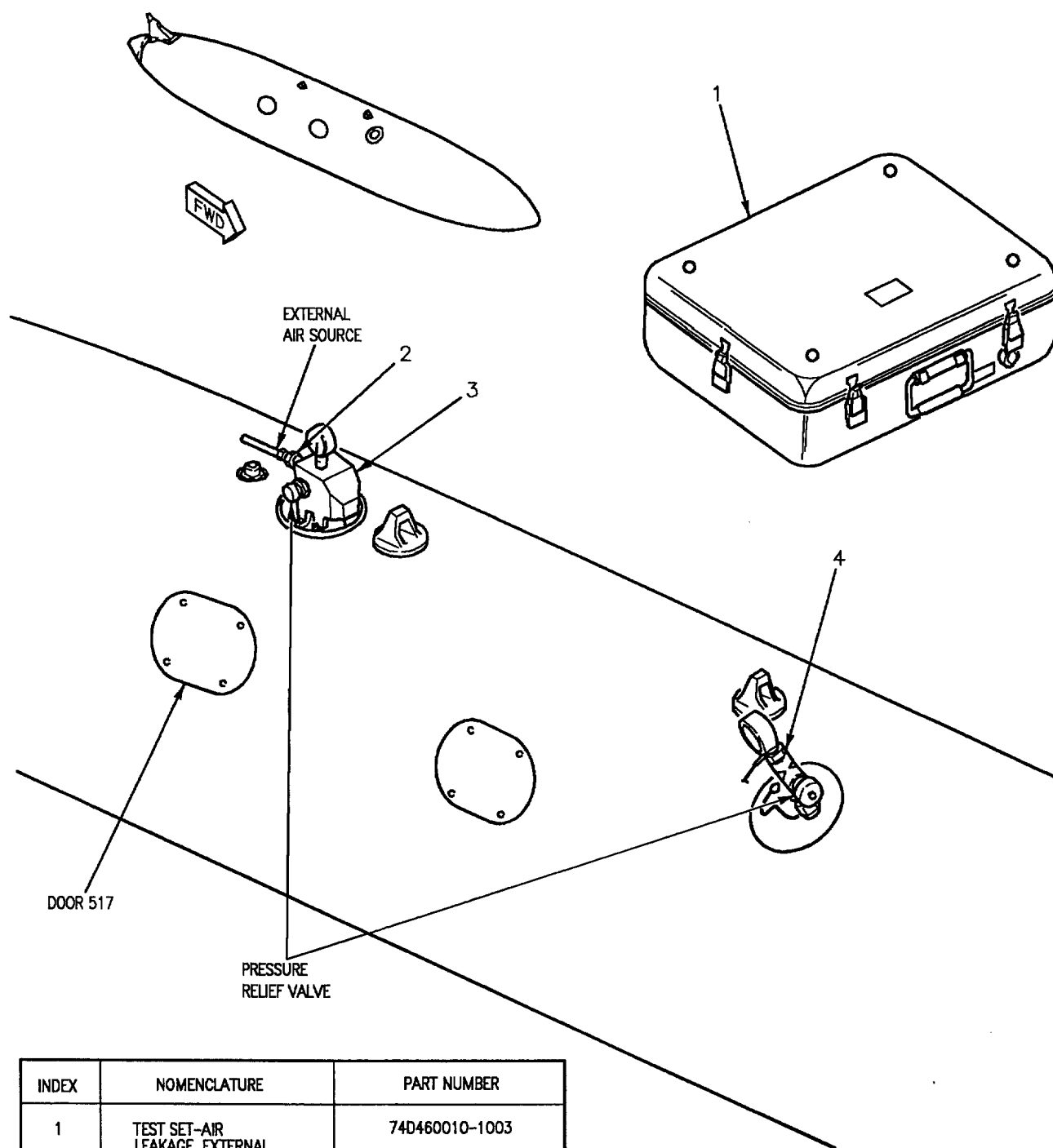
l. Refinish repaired areas (A1-F18AC-SRM-500, WP046 00).

12. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).

**LEGEND**

FLUSH AND CLEAN TANK BEFORE WELDING

Figure 2. Repair Procedure Two (Sheet 1)



INDEX	NOMENCLATURE	PART NUMBER
1	TEST SET-AIR LEAKAGE, EXTERNAL FUEL TANK	74D460010-1003
2	CONNECTOR	74D461011-1029
3	ADAPTER	74D461011-1021
4	GAGE	74D461011-1013

Figure 2. Repair Procedure Two (Sheet 2)

13. REPAIR PROCEDURE THREE.

14. REMOVAL OF EXTERNAL FUEL TANK.

- a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).
- b. Defuel external fuel tank (A1-F18AC-PCM-000).
- c. Drain residual fuel per substeps below:

(1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel



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WARNING

To prevent personal injury, do not stand directly under drain valve.

(2) Open drain valve.

(3) Close drain valve when residual fuel has drained.

d. Remove external fuel tank (A1-F18AC-LWS-000).

e. Purge external fuel tank until a safe indication is displayed on the indicator, per Combustible and Toxic Gas Indicator, and Purging Procedures, this WP.

15. REPAIRS. See figure 3.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Adhesive	FM300
Aluminum Patch	18AC-SRM-A1 Fabricate (WP006 01)
Aluminum Sheets, 4 Inch by 4 Inch	6061-T6, 0.032 and 0.063 Inch Thick
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before welding per purging procedures. Fuel presence while welding will cause fire and/or explosion.

a. Remove survivability wrap:

(1) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4

CAUTION

To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

(2) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

NOTE

Remove material so 3-1/2 inch clearance exists between wrap and damage on all sides.

(3) Remove damaged material using router bit, X-acto knife, and abrasive paper. Remove damage to a circular or oval shape.

(4) Vacuum clean repair area.

WARNING

Before welding, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Damage is repaired by welding (NAVAIR 01-1A-9).

c. Repair damage by a welded plug and bonded patch.

d. Remove damage to a circular or oval shape, which best fits the damage.

e. Limit repairs to substeps below:

(1) Plug material is 6061-T6 aluminum alloy, 0.063 inch thick.

(2) Patch material is 6061-T6 aluminum alloy, 0.032 inch thick.

(3) Patch and plug to be formed before welding and bonding.

(4) Damage not to exceed 2.5 inches in diameter in zones III, IV, and VI.

(5) Bonded patch overlaps damage by 1.5 inches.

f. Procedures for welding:

(1) Form plug to fit trimmed out damage and weld in place (NAVAIR 01-1A-9).

(2) Install doors 516 and 517 (A1-F18AC-LMM-010).

g. Leak test repairs, with the test set-air leakage, external fuel tank (1) per substeps below:

(1) Fill tank with water.

(2) Install adapter (3) on fuel/air coupling.

(3) Install connector (2) to adapter (3).

(4) Connect facility air to connector (2).

(5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gage (4) from tank.

(10) Drain water from tank.

h. Remove doors 516 and 517 (A1-F18AC-LMM-010).

i. Install tank fuel system components (A1-417AC-460-030, WP012 00):

(1) Pressure Relief Valve.

(2) Pressurization and Vent Valve.

(3) Fuel Quantity Transmitter.

(4) Manual Precheck Valve.

(5) Refuel/Transfer Shutoff Valve.

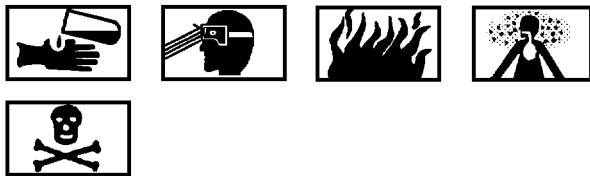
(6) Fuel Level Control Pilot Valve.

j. Install doors 516 and 517 (A1-F18AC-LMM-010).

k. Procedures for bonding of patch:

(1) Select applicable patch (A1-F18AC-SRM-250, WP006 01).

(2) Prepare repair area where patch will be bonded using abrasive paper.

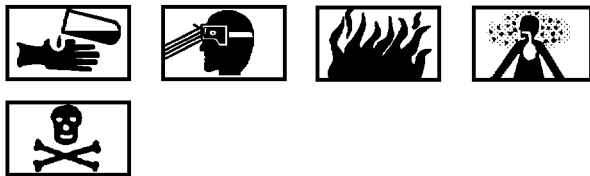


Adhesive

22

(3) Get FM300 adhesive (A1-F18AC-SRM-250, WP007 00).

(4) Install patch using FM300 adhesive, Aluminum Patch Installation (A1-F18AC-SRM-250, WP007 00).



Adhesive

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(5) Fill area between wrap and patch, using EA956 adhesive (A1-F18AC-SRM-200, WP011 00). Fill area until adhesive is flush with patch.

(6) Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

l. Replace survivability wrap per class VIII damage (WP022 02).

m. Refinish repaired areas (A1-F18AC-SRM-500, WP046 00).

16. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).

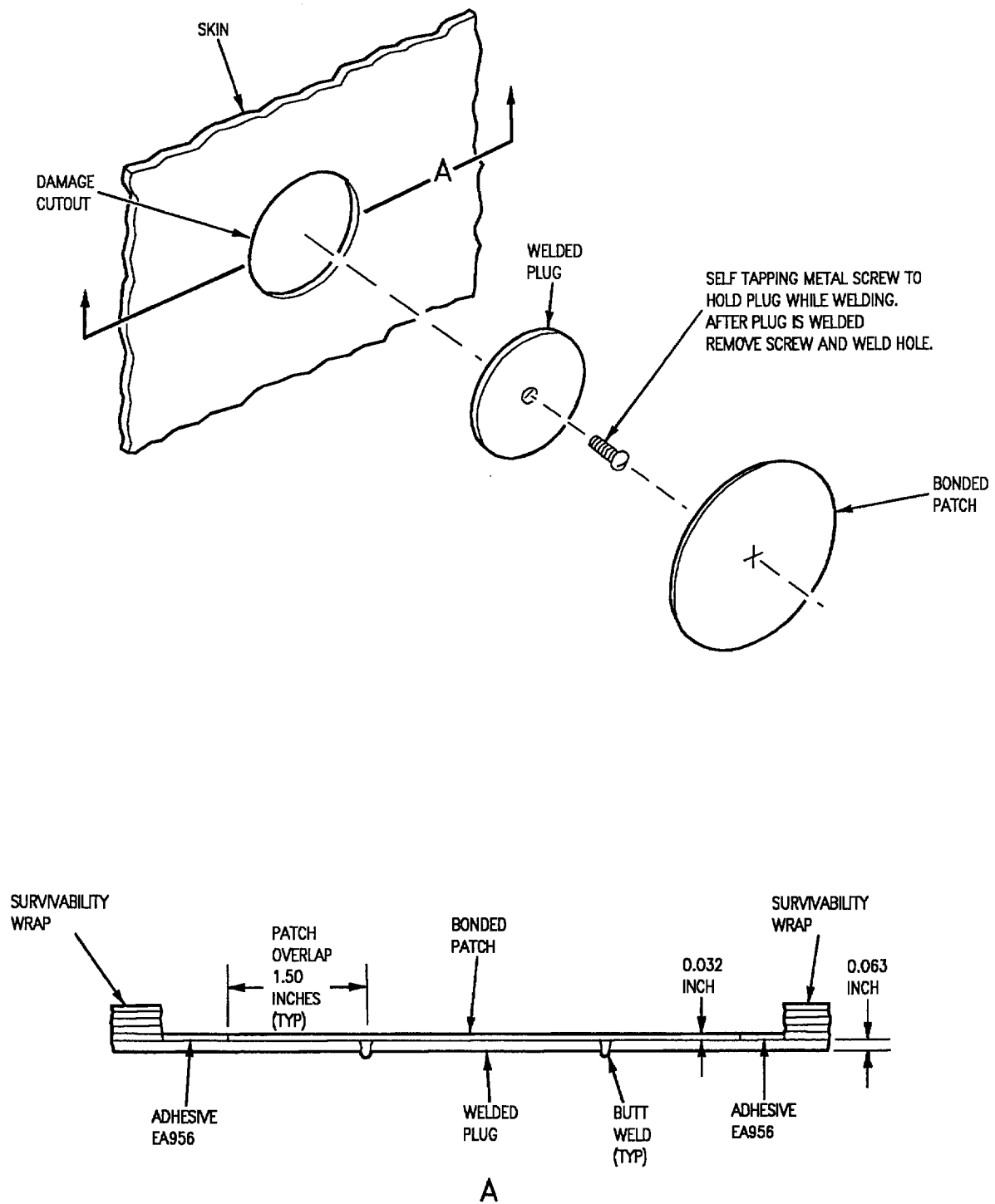
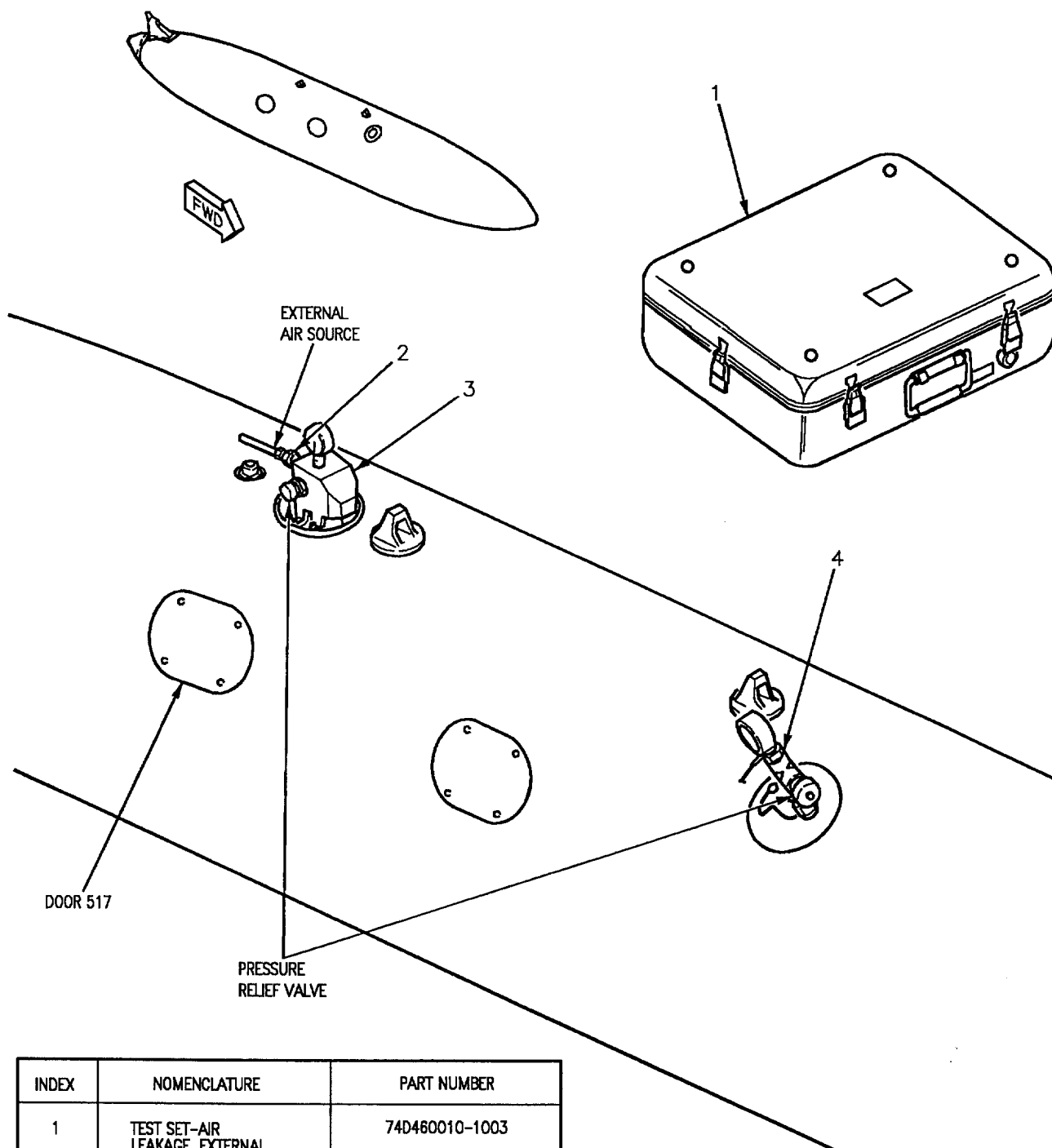


Figure 3. Repair Procedure Three (Sheet 1)



INDEX	NOMENCLATURE	PART NUMBER
1	TEST SET-AIR LEAKAGE, EXTERNAL FUEL TANK	74D460010-1003
2	CONNECTOR	74D461011-1029
3	ADAPTER	74D461011-1021
4	GAGE	74D461011-1013

Figure 3. Repair Procedure Three (Sheet 2)

17. REPAIR PROCEDURE FOUR.

18. REMOVAL OF EXTERNAL FUEL TANK.

- a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).
- b. Defuel external fuel tank (A1-F18AC-PCM-000).
- c. Drain residual fuel per substeps below:
 - (1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel



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WARNING

To prevent personal injury, do not stand directly under drain valve.

- (2) Open drain valve.
- (3) Close drain valve when residual fuel drained.

- d. Remove external fuel tank (A1-F18AC-LWS-000).

- e. Purge external fuel tank until a safe indication is displayed on the indicator per Combustible and Toxic Gas Indicator, and Purging Procedures, this WP.

19. REPAIRS. See figure 4.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Adhesive	FM300
Aluminum Patch	18AC-SRM-A1 Fabricate (WP006 01)
Aluminum Sheets, 6 Inch by 6 Inch	6061-T6, 0.025 and 0.063 Inch Thick
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before welding per purging procedures. Fuel presence while welding will cause fire and/or explosion.

- a. Remove survivability wrap:

- (1) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4

CAUTION

To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

- (2) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

NOTE

Remove material so 2 inch clearance exists between wrap and damage on all sides.

(3) Remove damaged material using router bit, X-acto knife, and abrasive paper. Remove damage to a circular or oval shape.

(4) Vacuum clean repair area.

WARNING

Before welding, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Damage is repaired by welding (NAVAIR 01-1A-9).

c. Repair damage by a welded plug and two externally bonded patches.

d. Remove damage to a circular or oval shape, which best fits the damage.

e. Limit repairs to substeps below:

(1) Plug material is 6061-T6 aluminum alloy, 0.063 inch thick.

(2) Material of patches is 6061-T6 aluminum alloy, 0.025 inch thick.

(3) Patches and plug to be formed before welding and bonding.

(4) Damage not to exceed 2.5 inches in diameter.

(5) Inner patch, bonded to external fuel tank skin and plug, overlaps plug by 1.5 inches.

(6) Outer patch, bonded to inner patch, overlaps plug by 1 inch.

f. Procedure for welding:

(1) Form plug to fit trimmed out damage and weld in place (NAVAIR 01-1A-9).

(2) Install doors 516 and 517 (A1-F18AC-LMM-010).

g. Leak test repairs, with the test set-air leakage, external fuel tank (1) per substeps below:

(1) Fill tank with water.

(2) Install adapter (3) on fuel/air coupling.

(3) Install connector (2) to adapter (3).

(4) Connect facility air to connector (2).

(5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gage (4) from tank.

(10) Drain water from tank.

h. Remove doors 516 and 517 (A1-F18AC-LMM-010).

i. Install tank fuel system components (A1-471AC-460-030, WP012 00):

(1) Pressure Relief Valve.

(2) Pressurization and Vent Valve.

(3) Fuel Quantity Transmitter.

(4) Manual Precheck Valve.

(5) Refuel/Transfer Shutoff Valve.

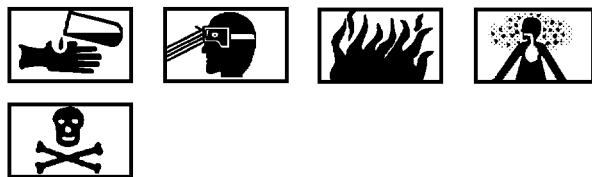
(6) Fuel Level Control Pilot Valve.

j. Install doors 516 and 517 (A1-F18AC-LMM-010).

k. Procedures for bonding of patch:

(1) Select applicable patch (A1-F18AC-SRM-250, WP006 01).

(2) Prepare repair area where patch will be bonded using abrasive paper.

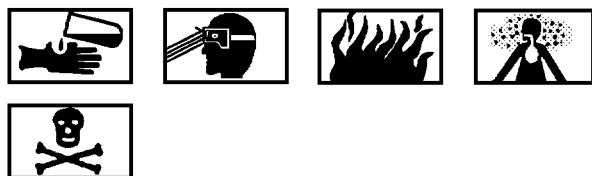


Adhesive

22

(3) Get FM300 adhesive (A1-F18AC-SRM-250, WP007 00).

(4) Install patch using FM300 adhesive, Aluminum Patch Installation (A1-F18AC-SRM-250, WP007 00).



Adhesive

19

(5) Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

(6) Fill area between wrap and patch, using EA956 adhesive. Fill area until adhesive is flush with patch.

(7) Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

l. Replace survivability wrap, per class VIII damage (WP022 02).

m. Refinish repaired area (A1-F18AC-SRM-500, WP046 00).

20. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).

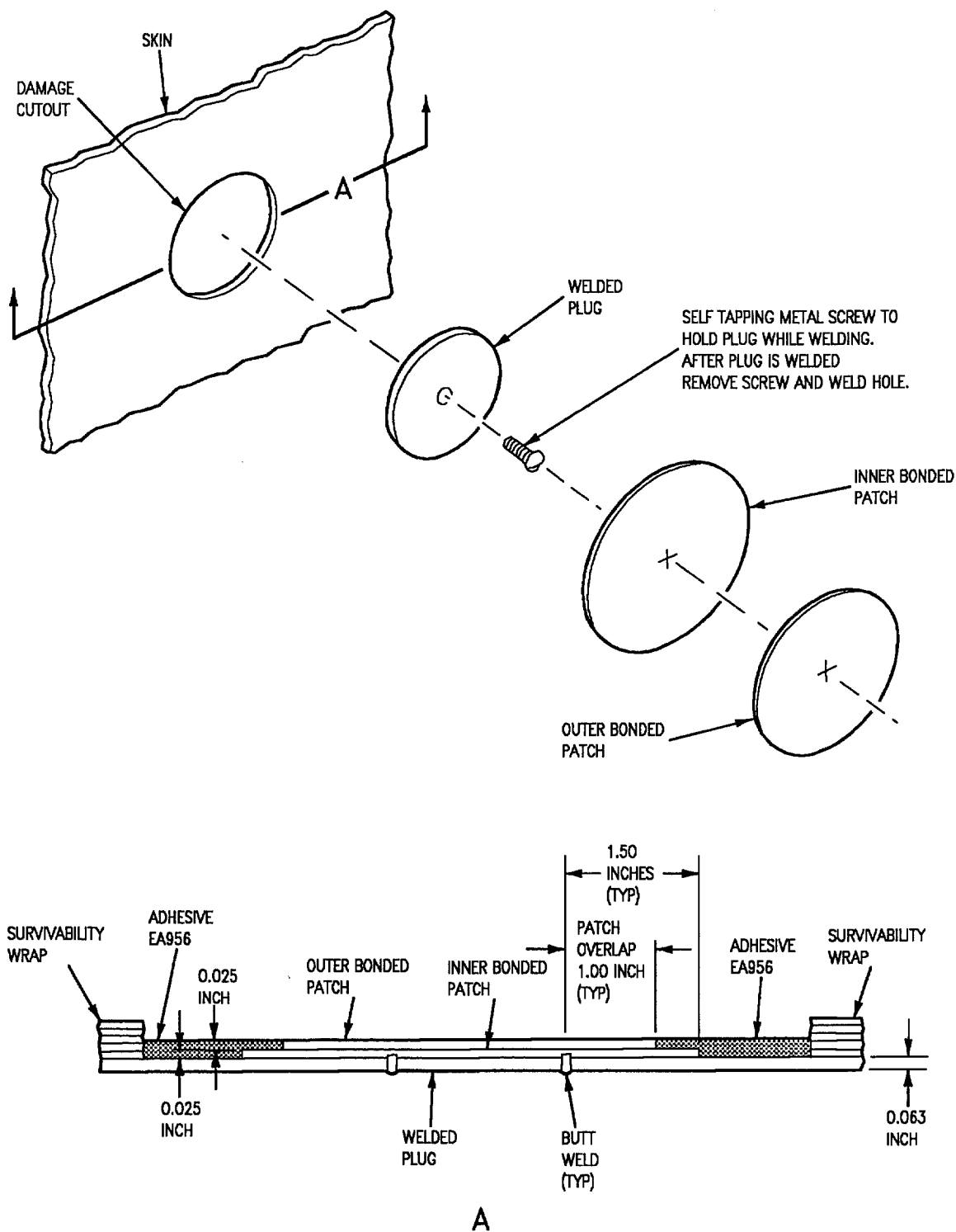
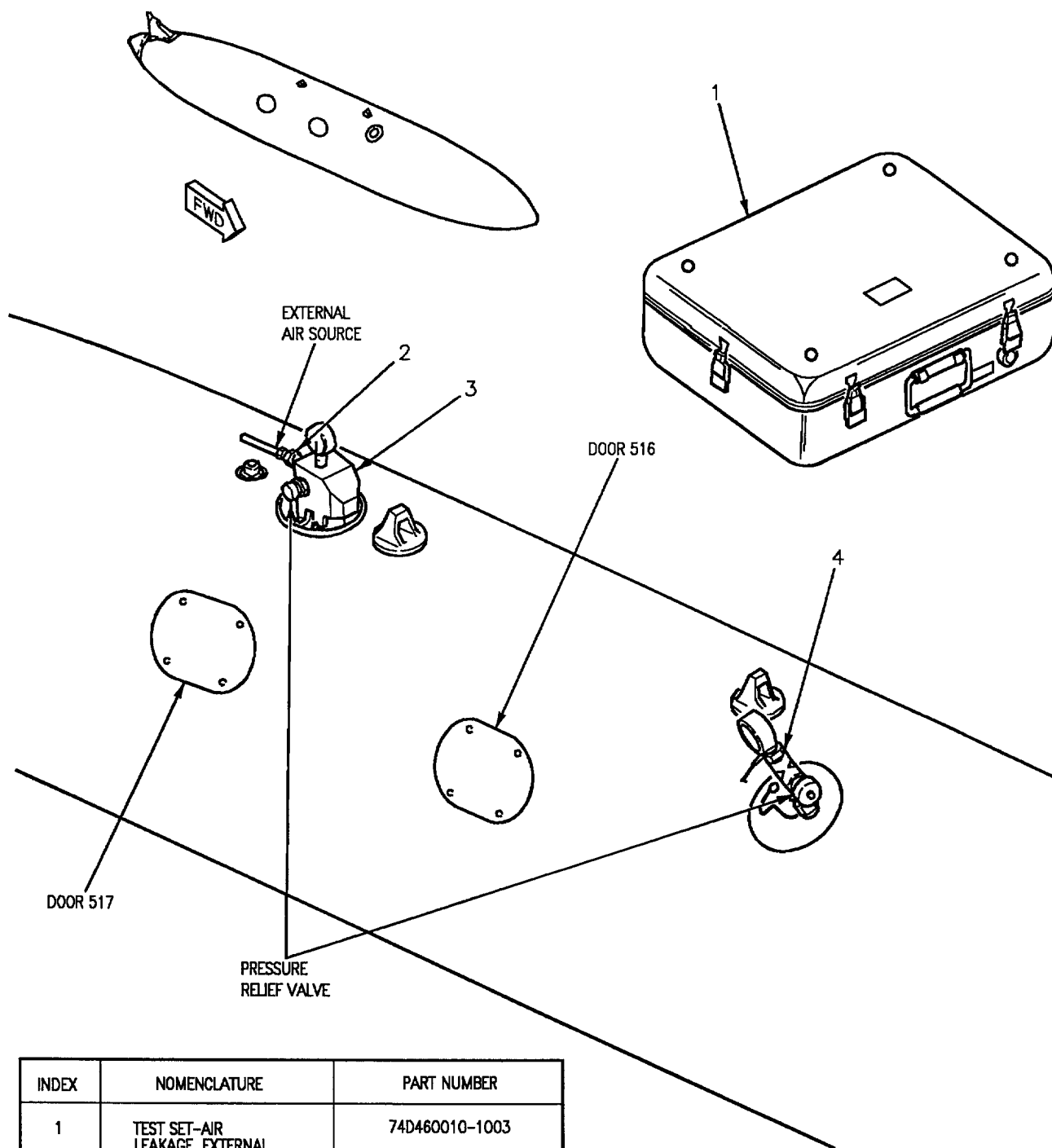


Figure 4. Repair Procedure Four (Sheet 1)



INDEX	NOMENCLATURE	PART NUMBER
1	TEST SET-AIR LEAKAGE, EXTERNAL FUEL TANK	74D460010-1003
2	CONNECTOR	74D461011-1029
3	ADAPTER	74D461011-1021
4	GAGE	74D461011-1013

Figure 4. Repair Procedure Four (Sheet 2)

21. REPAIR PROCEDURE FIVE.

22. REMOVAL OF EXTERNAL FUEL TANK.

- a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).
- b. Defuel external fuel tank (A1-F18AC-PCM-000).
- c. Drain residual fuel per substeps below:

(1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel



21

WARNING

To prevent personal injury, do not stand directly under drain valve.

(2) Open drain valve.

(3) Close drain valve when residual fuel has drained.

d. Remove external fuel tank (A1-F18AC-LWS-000).

e. Purge external fuel tank until a safe indication is displayed on the indicator, per Combustible and Toxic Gas Indicator, and Purging Procedures, this WP.

23. REPAIRS. See figure 5.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

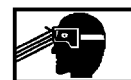
Nomenclature	Specification or Part Number
Adhesive	EA956
Aluminum Sheets, 4 Inch by 4 Inch	6061-T6, 0.071 Inch Thick
Apron, Utility	MIL-A-41829
Blind Rivet	NAS1398C4A
Blind Rivet	NAS1398C6A
Gloves, Chemical	ZZ-G-381, Type 1, Style 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Sealing Compound	MIL-S-83430
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before repairing per purging procedures. Fuel presence while cutting out damage will cause fire and/or explosion.

a. Remove survivability wrap:

(1) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4

CAUTION

To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

(2) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

NOTE

Remove material so 3/4-inch clearance exists between wrap and damage on all sides.

(3) Remove damaged material using router bit, X-acto knife, and abrasive paper. Remove damage to a circular or oval shape.

(4) Vacuum clean repair area.

WARNING

Before making repairs, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Repair damage by an internal doubler patch.

c. Limit aluminum skin damage cut out per substeps below:

(1) Cut out damage in an oval shape, to allow doubler to be inserted into tank.

(2) Length of cutout will equal the width plus 1.75 inches.

(3) Damage not to exceed 4.0 inches in length after cut out.

(4) Damage not to exceed 2.25 inches in width after cut out.

(5) Damage that is less than 0.50 inch in width is cut out to a minimum of 0.50 inch in width and 2.25 inch in length to allow for insertion of doubler.

d. Limit doubler to substeps below:

(1) Doubler material is 6061-T6 aluminum alloy, 0.071 inch thick and 1.50 inch larger in diameter than cut out.

(2) Doubler to be formed before fastening.

(3) Width of doubler will not exceed length of cut out.

e. Locate rivet holes per substeps below:

(1) Mark a concentric oval that is a distance of 0.38 inch from cut out on all sides.

(2) On this concentric oval, mark the center of a rivet hole at the center of each arc.

(3) Using the holes marked in substep (2) for reference, mark additional rivet holes at evenly spaced intervals as close as possible to 0.75 inch apart until damage is completely surrounded.

f. Use NAS1398C-6A blind rivets.



Sealing Compound

5

g. Coat rivets with MIL-S-83430 sealant, and install while sealant is wet (A1-F18AC-SRM-200, WP011 00).

h. Coat doubler with MIL-S-83430 sealant on the side that mates with external fuel tank skin before installation (A1-F18AC-SRM-200, WP011 00).

i. Seal fastener heads, damage hole, and doubler joint after repair is complete with MIL-S-83430 sealant (A1-F18AC-SRM-200, WP011 00).

j. Install doors 516 and 517 (A1-F18AC-LMM-010).

k. Leak test repairs, with the test set-air leakage, external fuel tank (1) per substeps below:

(1) Fill tank with water.

(2) Install adapter (3) on fuel/air coupling.

(3) Install connector (2) to adapter (3).

(4) Connect facility air to connector (2).

(5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gage (4) from tank.

(10) Drain water from tank.

l. Remove doors 516 and 517 (A1-F18AC-LMM-010).

m. Install tank fuel system components (A1-471AC-460-030, WP012 00):

(1) Pressure Relief Valve.

(2) Pressurization and Vent Valve.

(3) Fuel Quantity Transmitter.

(4) Manual Precheck Valve.

(5) Refuel/Transfer Shutoff Valve.

(6) Fuel Level Control Pilot Valve.

n. Install doors 516 and 517 (A1-F18AC-LMM-010).



Adhesive

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o. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

p. Fill cut out and area between the wrap and patch with adhesive. Fill until adhesive is flush with the top of fastener heads across complete repair area.

q. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

r. Replace survivability wrap per class VIII damage (WP022 02).

s. Refinish repaired areas (A1-F18AC-SRM-500, WP046 00).

24. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).

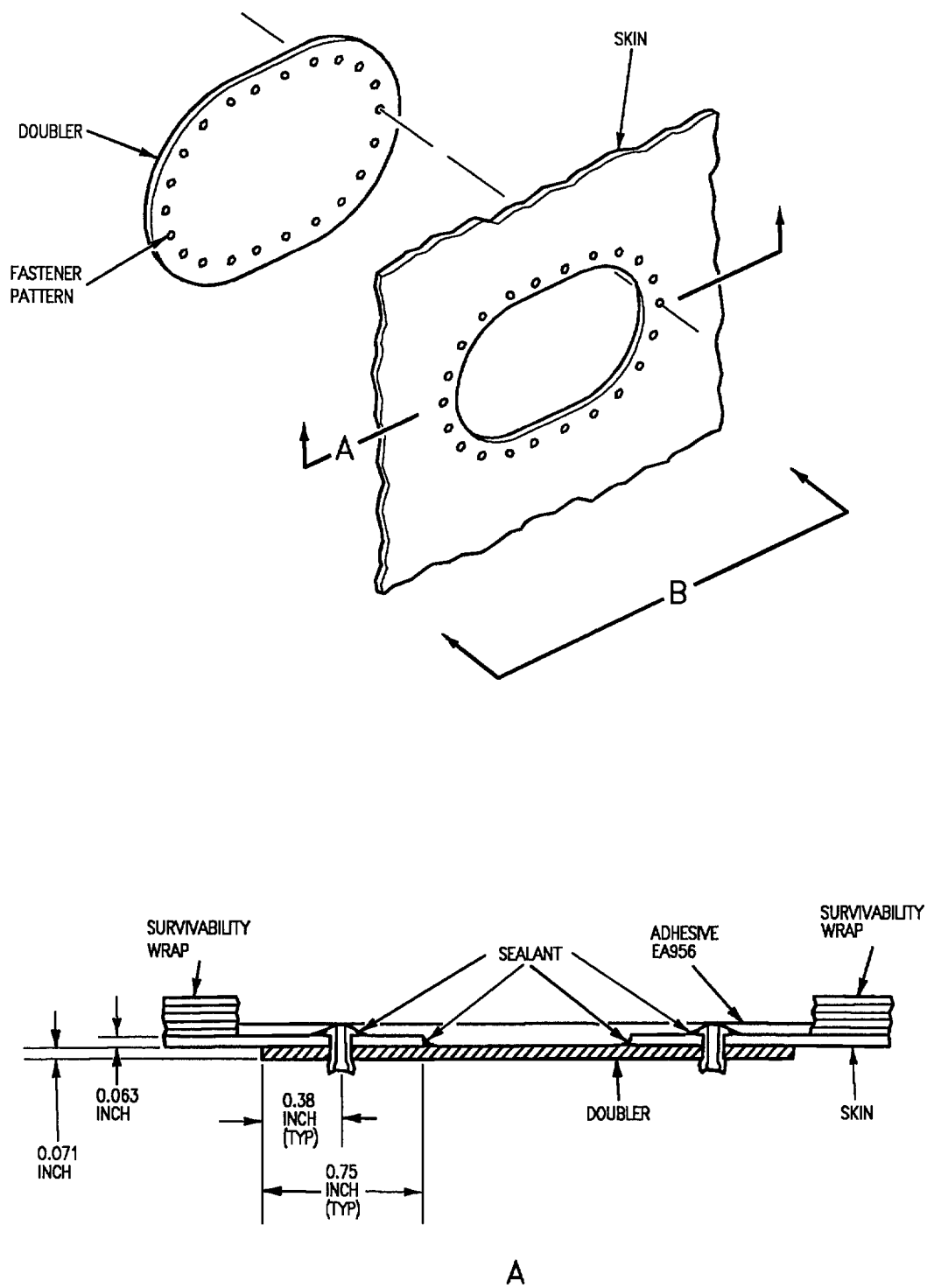
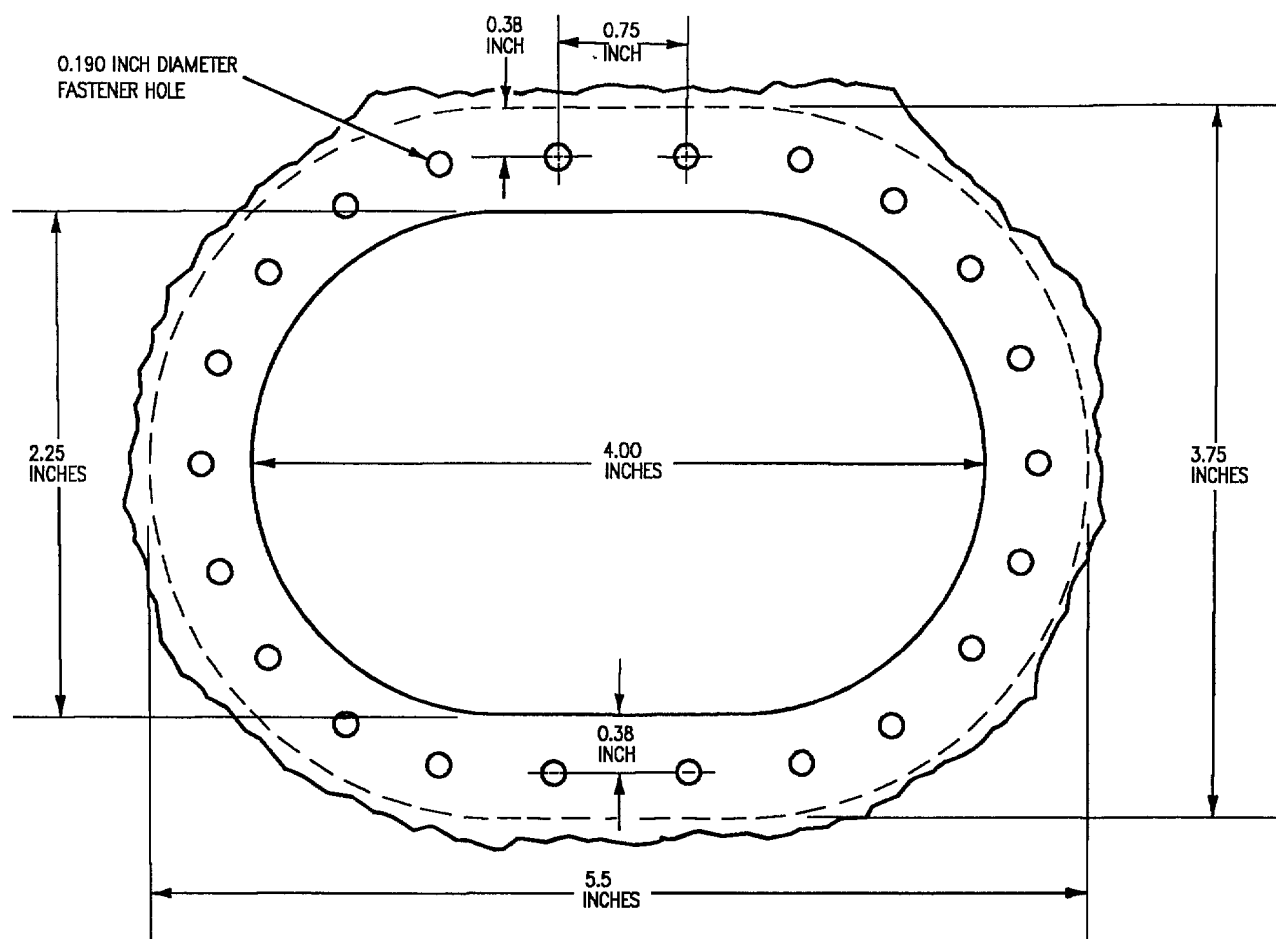
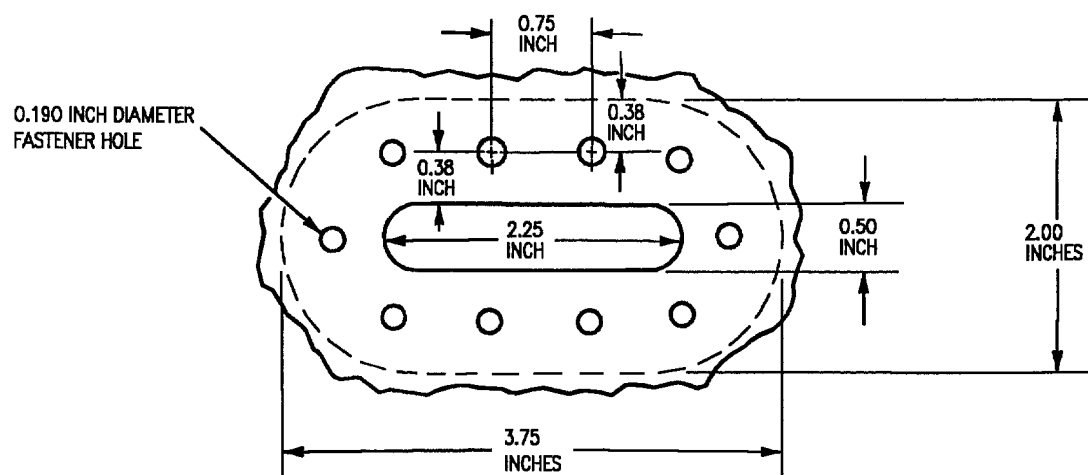


Figure 5. Repair Procedure Five (Sheet 1)



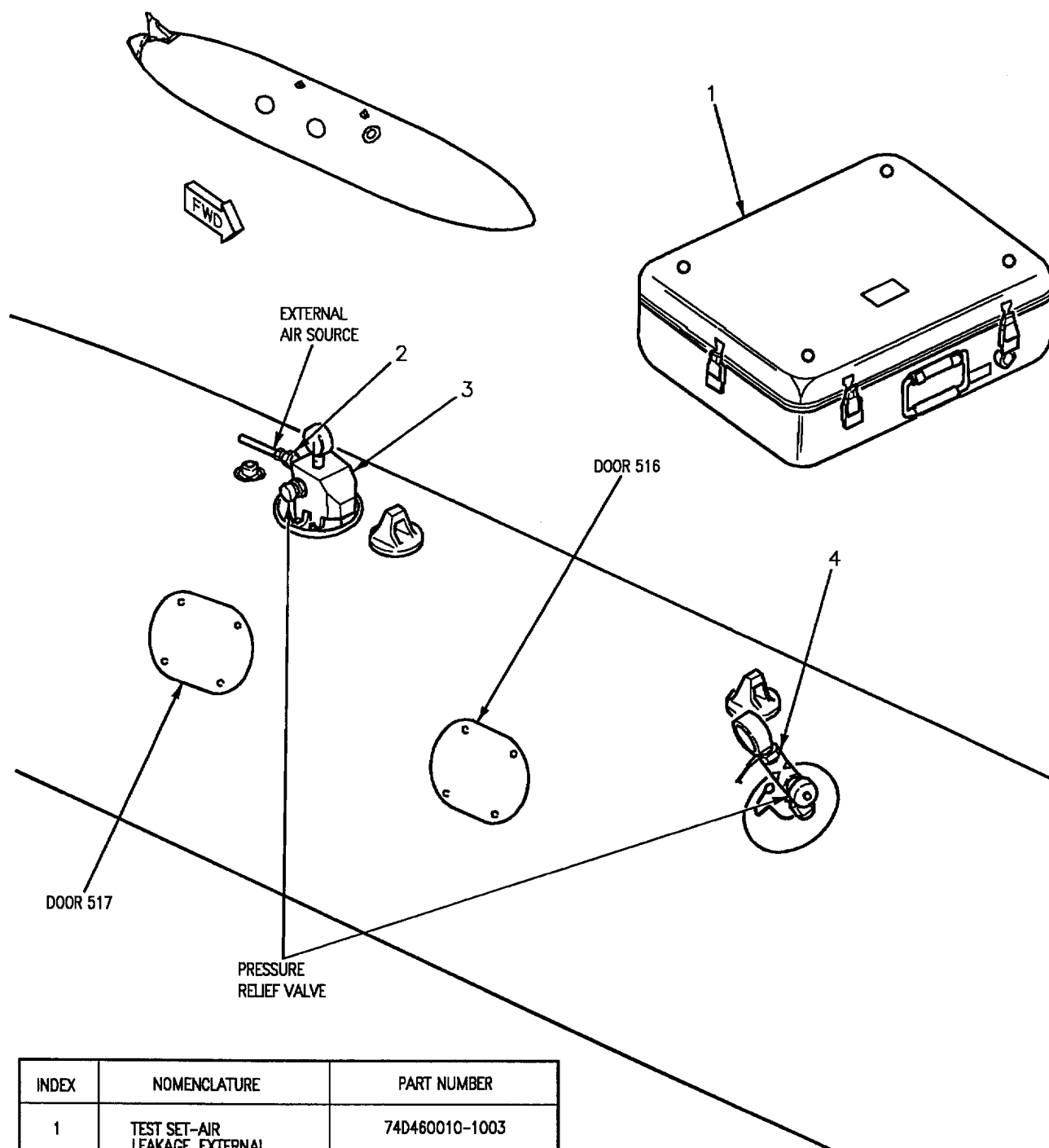
DOUBLER/MAXIMUM



DOUBLER/MINIMUM

B

Figure 5. Repair Procedure Five (Sheet 2)






INDEX	NOMENCLATURE	PART NUMBER
1	TEST SET-AIR LEAKAGE, EXTERNAL FUEL TANK	74D460010-1003
2	CONNECTOR	74D461011-1029
3	ADAPTER	74D461011-1021
4	GAGE	74D461011-1013

Figure 5. Repair Procedure Five (Sheet 3)

25. REPAIR PROCEDURE SIX.

26. REMOVAL OF EXTERNAL FUEL TANK.

- a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).
- b. Defuel external fuel tank (A1-F18AC-PCM-000).
- c. Drain residual fuel per substeps below:
 - (1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel

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WARNING

To prevent personal injury, do not stand directly under drain valve.

- (2) Open drain valve.
- (3) Close drain valve when residual fuel has drained.
- d. Remove external fuel tank (A1-F18AC-LWS-000).
- e. Purge external fuel tank until a safe indication is displayed on the indicator, per Combustible and Toxic Gas Indicator, and Purging Procedures, this WP.

27. REPAIRS. See figure 6.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Aluminum Sheets, 8 Inch by 8 Inch	6061-T6, 0.071 Inch Thick
Apron, Utility	MIL-A-41829
Blind Rivet	NAS1398C4A
Blind Rivet	NAS1398C6A
Gloves, Chemical	ZZ-G-381, Type 1, Style 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Sealing Compound	MIL-S-83430
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before repairing per purging procedures. Fuel presence while cutting out damage will cause fire and/or explosion.

a. Remove survivability wrap:

- (1) For aluminum skin damage not more than 3 inches in length, the survivability wrap is cut out so that a 1 inch clearance exists between wrap and damage on all sides.
- (2) For aluminum skin damage more than 3 inches, but less than 6 inches in length, the survivability wrap shall be cut out so that a 1.50 inch clearance exists between wrap and damage on all sides.
- (3) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

(4) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

(5) Remove damaged material using a router bit, X-acto knife, and abrasive paper.

(6) Vacuum clean repair area.

WARNING

Before making repairs, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Repair damage by an internal doubler patch.

c. Limit aluminum skin damage cut out per substeps below:

(1) Cut out damage in an oval shape, to allow doubler to be inserted into the tank.

(2) For damage that is not more than 3 inches on longest side, the length of cut out should equal width plus 2.25 inches.

(3) For damage that is more than 3 inches on longest side, the length of cut out should be equal the width plus 3.25 inches.

(4) Damage is not to exceed 6 inches in length after cut out in zones III, IV, and VI.

(5) Damage is not to exceed 3 inches in length after cut out in zone VII.

(6) Damage is not to exceed 2.75 inches in width after cut out in zones III, IV, and VI.

(7) Damage is not to exceed 0.75 inch in width after cut out in zone VII.

(8) Damage that is less than 0.50 inch in width is cut out to a minimum of 0.50 inch in width and 2.75 inch in length to allow for insertion of doubler.

d. Limit doubler to substeps below:

(1) Doubler material is 6061-T6 aluminum alloy, 0.071 inch thick and 16 rivet diameters larger in diameter than cut out.

(2) Doubler to be formed before fastening.

(3) Width of doubler must not exceed the length of cut out.

e. Locate rivet holes in damage that is not more than 3 inches in length per substeps below:

(1) Mark a concentric oval that is a distance of 0.25 inch from cut out on all sides.

(2) Mark a second concentric oval that is a distance of 0.75 inch from cut out on all sides.

(3) On the concentric oval closest to the damage, mark the center of a rivet hole at the center of each arc.

(4) Using the holes marked in substep (3) for reference, mark additional rivet holes at evenly spaced intervals as close as possible to 0.50 inch spacing on the inner concentric oval until the damage is completely surrounded.

(5) On the outer concentric oval, mark rivet holes midway between two rivet hole locations on the inner concentric oval until the damage is completely surrounded.

f. Locate rivet holes in damage that is more than 3 inches in length per substeps below:

(1) Mark a concentric oval that is a distance of 0.38 inch from cut out on all sides.

(2) Mark a second concentric oval that is a distance of 1.15 inches from cut out on all sides.

(3) On concentric oval closest to the damage, mark the center of a rivet hole at the center of each arc.

(4) Using the holes marked in substep (3) for reference, mark additional rivet holes at evenly spaced intervals as close as possible to 0.75 inch spacing on the inner concentric oval until the damage is completely surrounded.

(5) On the outer concentric oval, mark rivet holes midway between two rivet hole locations on the inner concentric oval until the damage is completely surrounded.

g. Use NAS1398C-4A blind rivets when damage is less, but not more than 3 inches in length.

h. Use NAS1398C-6A blind rivets when damage is more than 3 inches, but less than 6 inches.



Sealing Compound



5

i. Coat rivets with MIL-S-83430 sealant, and install while sealant is wet (A1-F18AC-SRM-200, WP011 00).

j. Coat doubler with MIL-S-83430 sealant on the side that mates with external fuel tank skin before installation (A1-F18AC-SRM-200, WP011 00).

k. Seal fastener heads, damage hole, and doubler joint after repair is complete with MIL-S-83430 sealant (A1-F18AC-SRM-200, WP011 00).

l. Install doors 516 and 517 (A1-F18AC-LMM-010).

m. Leak test repairs, with the test set-air leakage, external fuel tank (1) per substeps below:

- (1) Fill tank with water.
- (2) Install adapter (3) on fuel/air coupling.
- (3) Install connector (2) to adapter (3).
- (4) Connect facility air to connector (2).
- (5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gage (4) from tank.

(10) Drain water from tank.

n. Remove doors 516 and 517 (A1-F18AC-LMM-010).

o. Install tank fuel system components (A1-471AC-460-030, WP012 00):

- (1) Pressure Relief Valve.
- (2) Pressurization and Vent Valve.
- (3) Fuel Quantity Transmitter.
- (4) Manual Precheck Valve.
- (5) Refuel/Transfer Shutoff Valve.
- (6) Fuel Level Control Pilot Valve.

p. Install doors 516 and 517 (A1-F18AC-LMM-010).



Adhesive

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q. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

r. Fill cut out and area between the wrap and patch with adhesive. Fill until adhesive is flush with the top of fastener heads across complete repair area.

s. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

t. Replace survivability wrap per class VIII damage (WP022 02).

u. Refinish repaired areas (A1-F18AC-SRM-500, WP046 00).

28. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).

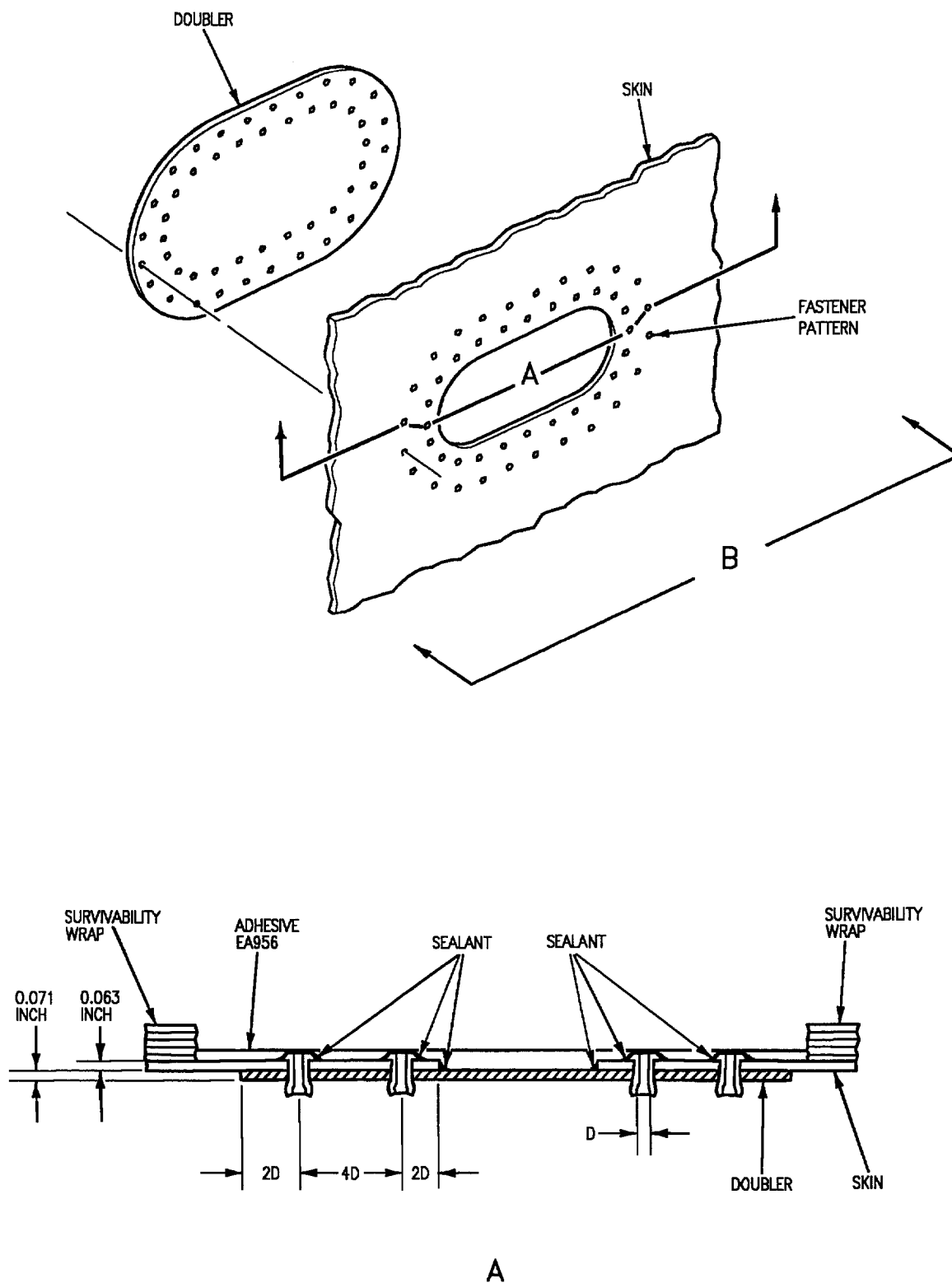
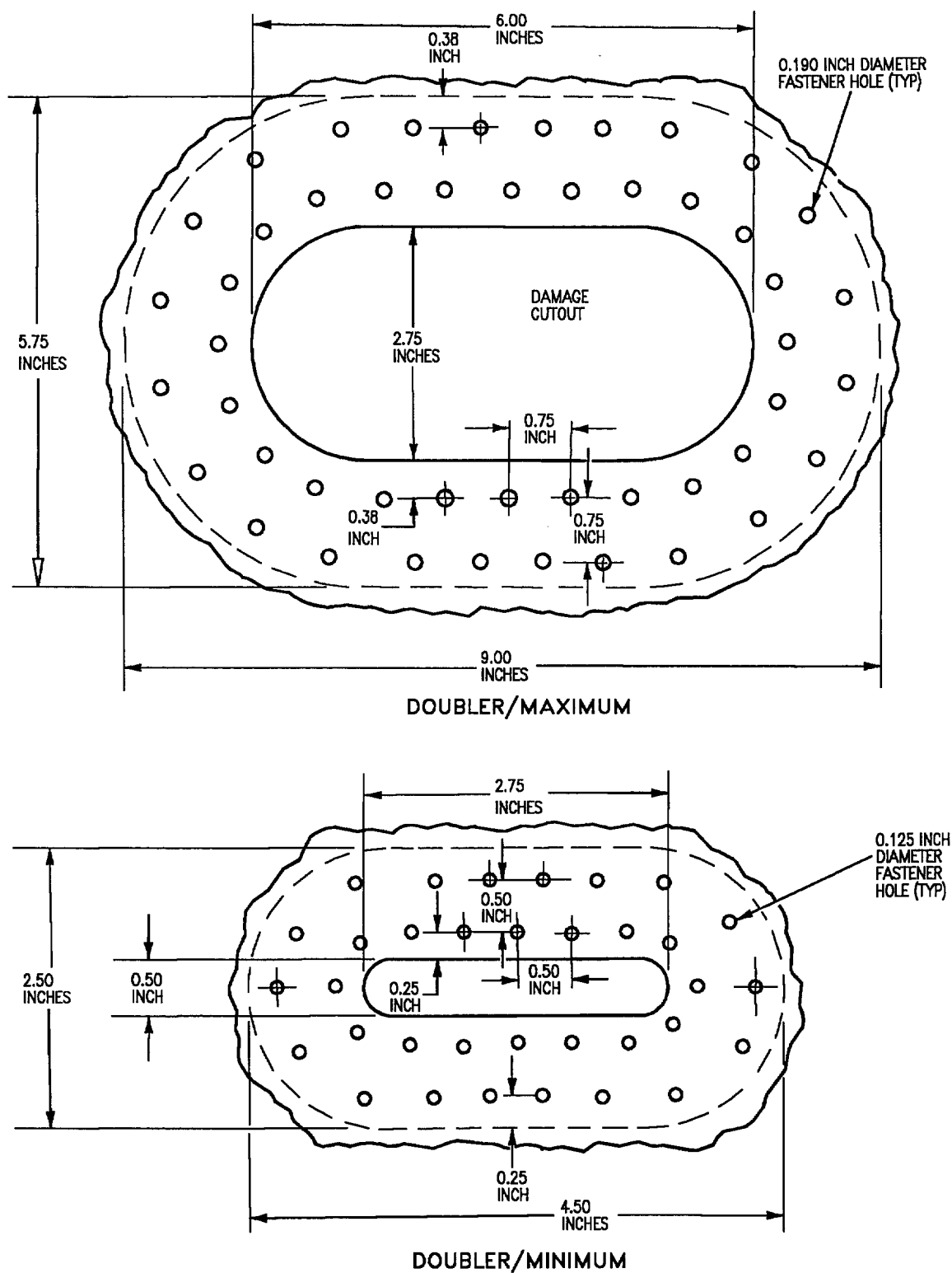


Figure 6. Repair Procedure Six (Sheet 1)



B

Figure 6. Repair Procedure Six (Sheet 2)

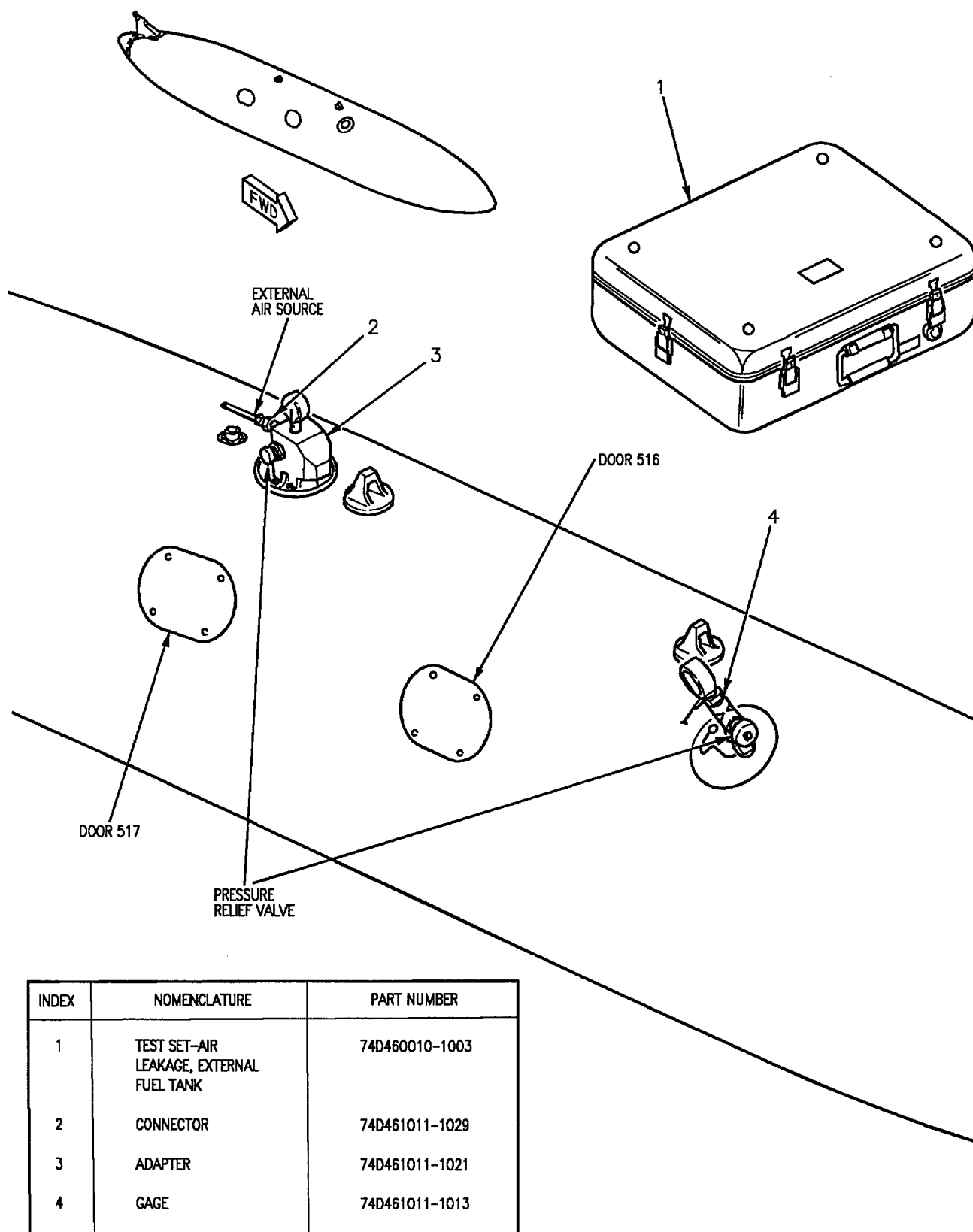


Figure 6. Repair Procedure Six (Sheet 3)

INTERMEDIATE MAINTENANCE

STRUCTURE REPAIR

STRAIN GAGES

Title	WP Number
Strain Gages	
Replacement of Wing Lug Strain Gages	023 01
Replacement of Outer Wing Strain Gages	023 02

INTERMEDIATE MAINTENANCE

STRUCTURE REPAIR

REPLACEMENT OF WING LUG STRAIN GAGES

Reference Material

Aircraft Corrosion Control	A1-F18AC-SRM-500
Finish System	WP012 00
Fuel System	A1-F18AC-460-300
No. 4 Fuel Tank Cavity Bulkhead Fittings and Supports	WP043 00
Integrated Flight Controls	A1-F18AC-570-300
Leading Edge Flap Drive Unit and Servo Valve (84A-M021) - 161353 THRU 161519	WP035 00
Leading Edge Flap Servo Valve and Drive Unit (84A-M021) - 161520 AND UP	WP036 01
Line Maintenance Access Doors	A1-F18AC-LMM-010
Line Maintenance Procedures	A1-F18AC-LMM-000
Maintenance Status Display and Recording System	A1-F18AC-580-300
Strain Gages Part No. DTD2684	WP006 00
Plane Captain Manual	A1-F18AC-PCM-000
Structure Illustrated Parts Breakdown-Wing	A1-F18AC-SRM-410
Structure Assy, Wing, Inner	FIG013 00
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Wiring Repair With Parts Data, General Wiring Repair Procedures	A1-F18AC-WRM-000
Installation Practices, Aircraft Electrical and Electronic Wiring	NAVAIR 01-1A-505

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Bonding Surface Preparation	3
E92111 Bonding Fixture Preparation	5
Final Aircraft Preparation	8
Preparation of Adhesive	6
Resistance and Null Testing of New Strain Gages	5
Strain Gage Installation	6
Strain Gage Wire Preparation	4

Record of Applicable Technical Directives

None

Support Equipment Required

Nomenclature	Part Number or Type Designation
Digital Multimeter	8840A/AA
Heat Gun	-
Megohmmeter, Portable	1863
Power Supply	6214A
Scale, Balance, Trip, 0.10 Gram Graduations	-
Scraper, Plastic	-
Strain Sensor Bonding Fixture Kit	160198-1
Torque Wrench, 0 to 120 Inch-Pounds	-
Vacuum Cleaner	-

Materials Required**NOTE**

Alternate item specifications or part numbers are shown in parentheses.

Nomenclature	Specification or Part Number
Adhesive	EA956
Cloth, Abrasive	AA1048TY1CL1, Grit 320
Cloth, Scrim, Nylon	Pattern 30
Cotter Pin	MS24665-153
Cup, Paper, Wax-Free	UU-C-806, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Nitrogen, Technical Grade A or B	BB-N-411, Type 1, Class 1,
Petrolatum, Technical	VV-P-236
Plastic Film	100SG30TR
Release Agent	Airtech A4000
Rymple Cloth	AMS-3819
Scouring Powder	AA47
Sealing Compound	MIL-S-81733, Type 1/2 (MIL-S-83430)
Tape, Pressure Sensitive	A-A-883, Type 1, 1 1/2 Inch

Materials Required (Continued)

Nomenclature	Specification or Part Number
Thermofit Sleeve, 1/16 Inch Diameter, Color White	M23053/5-102-9
Thermofit Sleeve, 1/8 Inch Diameter, Color Black	M23053/5-104-0
Thermofit Sleeve, 3/16 Inch Diameter, Color White	M23053/5-105-9
Tongue Depressor, Wooden Spatula	GG-D-226 226244, Type 1
Water, Distilled	O-C-265

1. DESCRIPTION.**NOTE**

E92111 Bonding Fixture is part of 160198-1 Strain Sensor Bonding Fixture Kit.

2. Strain gages are sensitive fatigue monitoring units that measure the amount of stress a specific area is receiving. Located on the left lower wing lug at Y470.500 are primary and backup strain gages. The primary strain gage is bonded to the forward surface of the wing lug and is spliced into the maintenance status display and recording system wiring. The backup strain gage is bonded to the aft surface of the wing lug and is capped and stowed to be used if the primary strain gage fails. Procedures below provide for removal and installation of strain gages. For strain gage part number requisitioning (A1-F18AC-SRM-410, Fig 013 00).

3. AIRCRAFT PREPARATION. See figure 1.

a. Make sure electrical and hydraulic power is off (A1-F18AC-LMM-000).

b. Make sure safety devices required for ground operations are installed (A1-F18AC-PCM-000).

- c. Defuel aircraft (A1-F18AC-PCM-000).

NOTE

Strain gage wiring splice point is accessible through lower door 113L. However, doors 34L and 41L, and the leading edge flap servo valve and drive unit may be removed for more access to the strain gage wiring and splice point.

- d. Remove door 34L and 41L, or door 113L as required. (A1-F18AC-LMM-010).

- e. If required, on 161353 THRU 161519, remove leading edge flap servo valve and drive unit (A1-F18AC-570-300, WP035 00).

- f. If required, on 161520 AND UP, remove leading edge flap servo valve and drive unit (A1-F18AC-570-300, WP036 01).



Plug openings where fuel transfer adapter tube and refuel/defuel tube assemblies attach with wing and center fuselage to prevent FOD entering fuel lines.

- g. Remove inboard wing to fuselage adapter, motive flow tube assembly, fuel transfer adapter tube, and refuel/defuel tube assembly (A1-F18AC-460-300, WP043 00).



Be careful when removing strain gages not to damage titanium surfaces of wing lug.

- h. Remove lower wing lug attach pin caps at Y470.500, detail A:

- (1) Remove sealant around bolt head, caps, nut, and cotter pin using plastic scraper.
- (2) Remove cotter pin, nut, and washer from bolt.
- (3) Remove bolt and caps from attach pin.
- (4) Remove any remaining sealant from nut, bolt head, caps, and wing lug surfaces.

- i. Remove primary strain gage from forward surface of wing lug and backup strain gage from aft surface of wing lug using scraper, detail A.

- j. Remove ground wire and disconnect strain gage at wire bundle splice WTU007 located in door 34 left bay, detail B.

NOTE

Strain gages are not reusable.

- k. Pull strain gage lead wiring from sealant and dispose of gages.

- l. Remove any residual sealant from wing structure using plastic scraper.

- m. Do Bonding Surface Preparation, this work package.

4. BONDING SURFACE PREPARATION. See figure 2.



Make sure all sealant on bottom surface of wing lug is removed to allow fixture to be correctly positioned.

- a. Remove any residual adhesive and/or sealant, remaining from previously installed strain gages, using a plastic scraper. Abrasive cloth may be required for complete removal of adhesive.



Isopropyl Alcohol

4

- b. Degrease wing lug surface using clean rymple cloth moistened with isopropyl alcohol.

NOTE

Do not allow isopropyl alcohol to evaporate on wing lug surface before wiping.

- c. Immediately wipe surface dry with clean dry rymple cloth.

d. Temporarily install strain gage bonding fixture per Strain Gage Installation, this WP, step d, to get correct strain gage location. Remove fixture after location is noted.

NOTE

Do not sand in circular motion. Only 1 square inch area shall be sanded for each strain gage.

e. Wet sand, in perpendicular directions, a 1 inch square area on each side of wing lug using abrasive cloth and distilled water.

f. Remove sanding residue using clean rymple cloth moistened with distilled water.

g. Scour bonding surfaces on wing lug using non-chlorinated scouring powder and clean rymple cloth moistened with distilled water.

h. Repeat steps e, f, and g to make sure clean bonding surface exists on wing lug.

i. Remove all scouring residue using clean rymple cloth moistened with distilled water.

j. Check for a water-break free surface by spraying a small amount of distilled water onto wing lug bonding surfaces. If water breaks or balls up, instead of remaining continuous, repeat steps e thru j.



Nitrogen

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NOTE

Bonding surface can be force dried using dry, oil free nitrogen or other inert gas.

k. Allow bonding surface to air dry.

l. Do Strain Gage Wire Preparation, this work package.

5. STRAIN GAGE WIRE PREPARATION. See figure 3.

The strain gage is a delicate electrical device. Use care when handling to avoid damage.

a. Mark wire numbers on 1/16 inch diameter white thermofit sleeves (NAVAIR 01-1A-505). For wire number identification (A1-F18A()-WRM-000).

b. Mark wire bundle number on 3/16 inch diameter white thermofit sleeve (NAVAIR 01-1A-505). For wire bundle number identification (A1-F18A()-WRM-000).

c. Cut a piece of 1/8 inch diameter black thermofit sleeving to dimension shown on figure.



Do not apply heat directly to strain gage. Damage to strain gage will occur if excessive heat is applied to sensor end.

d. Heat shrink forward wire number identification sleeves to dimension shown on figure (NAVAIR 01-1A-505). For correct wire number to wire color identification (A1-F18A()-WRM-000).

NOTE

Keep strain gage wire leads flat 4 inches from wire exit side of sensor when shrinking 1/8 inch diameter thermofit sleeving.

e. Cover strain gage wire leads with 1/8 inch diameter thermofit sleeving and heat shrink to dimension shown on figure (NAVAIR 01-1A-505).

f. Heat shrink wire bundle identification sleeve to dimension shown on figure (NAVAIR 01-1A-505).

g. Heat shrink aft wire number identification sleeves to dimension shown on figure (NAVAIR

01-1A-505). For correct wire number to wire color identification (A1-F18A()-WRM-000).

h. Do Resistance and Null Testing of New Strain Gage, this work package.

6. RESISTANCE AND NULL TESTING OF NEW STRAIN GAGE. See figure 4.

a. Do resistance test using a portable megohmmeter. Resistance between wire leads shall be approximately as listed below:

(1) Wire leads B - D should equal 980 to 1020 ohms.

(2) Wire leads A - C should equal 980 to 1020 ohms.

NOTE

Resistance test between wire leads A - GROUND is not applicable when testing new strain gage before installation.

(3) Wire leads A - GROUND should equal 500K ohms minimum.

b. Do null test using digital multimeter and power supply unit:

NOTE

Record all null test readings for each strain gage on attached card. Keep card attached to strain gage until strain gage is installed and final null offset test is completed.

(1) Position sensing side of strain gage on clean flat stainless steel plate surface.

(2) Place a 75 gram weight on strain gage.

(3) Apply 10 VDC across wire leads A - C.

(4) Read millivolt (mV) output across wire leads B - D. Acceptable reading is from + 10mV to - 10mV. Record reading on card.

c. Do Bonding Fixture Preparation, this work package.

7. E92111 BONDING FIXTURE PREPARATION. See figure 2.

NOTE

Dowel pin should extend out approximately 0.375 inch to make sure correct contact on wing lug will occur.

a. Make sure dowel pin is inserted into 0.125 inch hole in aft locator (detail 9) and forward locator (detail 10).

NOTE

Before installing clamp assembly (detail 5), turn bolt assembly (detail 6) counterclockwise until end pad will clear strain gage cutout in locator assemblies.

b. Locate slotted section of clamp assembly (detail 5) in line with 0.25 inch threaded hole in aft locator (detail 9) and install cap screw (detail 17).

c. Locate slotted section of clamp assembly (detail 5) in line with 0.25 inch threaded hole in forward locator (detail 10) and install cap screw (detail 17).



Isopropyl Alcohol

4



Release agent must be sprayed onto the tooling fixture away from the aircraft to prevent the possibility of release agent contacting the bonding surfaces on wing lugs.

NOTE

Allow 5 minutes of dry time between coats of release agent.



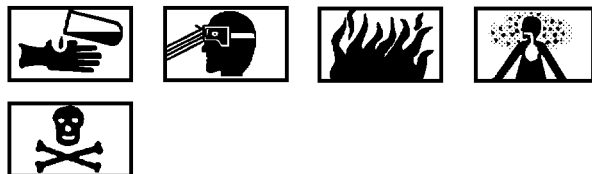
Release Agent

24

d. Spray apply two coats of Airtech A4000 release agent on surfaces of bonding fixture which will face the wing lug surface and come in contact with adhesive.

e. Do Preparation of Adhesive, this work package.

8. PREPARATION OF ADHESIVE.



Adhesive

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NOTE

Adhesive has a pot life of 45 minutes. Do not mix more material than can be used in 30 minutes. The amount in step a is more than is needed to bond two strain gages. The amount in step a may be increased or decreased by multiplying or dividing each part by the same number.

a. Combine by weight 100 parts of part A with 58 parts of part B of EA956 adhesive.

b. Mix parts A and B, using tongue depressor, in a wax free non-absorbent paper cup to a uniform consistency leaving no unmixed material around edges of cup.

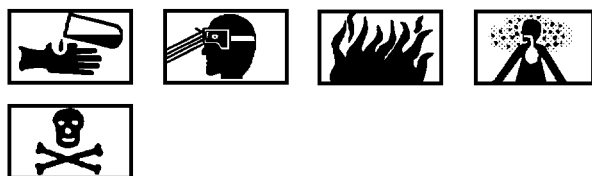
NOTE

Make sure no air bubbles appear in adhesive.

c. Do Strain Gage Installation, this work package.

9. STRAIN GAGE INSTALLATION. See figure 2.

a. Cut 1 inch square piece of nylon cloth (scrim cloth) for each strain gage.



Adhesive

19

NOTE

Reclean bonding surface of wing lug per paragraph 4, steps e thru k, if adhesive is not applied within 30 minutes after surface preparation.

b. Apply a thin film of adhesive, approximately 3 to 5 mils thick, to bonding surfaces of wing lug. Rub adhesive firmly onto surfaces using plastic spatula.

NOTE

Make sure scrim cloth is wet with adhesive after being positioned.

c. Apply scrim cloth over adhesive.

d. Install bonding fixture on wing lug:

(1) Insert stud (detail 8) through wing lug attach pin hole.

(2) Align hole in plug (detail 11) with stud (detail 8) and slide aft locator (detail 9) and forward locator (detail 10) on to stud.

(3) Seat plugs (detail 11) into the wing attach pin holes and install nut (detail 16) on each end of stud (detail 8), but do not tighten.

(4) Rotate aft locator (detail 9) and forward locator (detail 10) until dowel pin is firmly seated against bottom surface of wing lug.



Make sure dowel pins remain seated against bottom surface of wing lug during installation. Misalignment of strain gage will result if dowel pin is moved from this location.

(5) While holding dowel pins against bottom surface of wing lug, hand tighten nuts (detail 16) to secure bonding fixture in place.



Be careful when handling strain gage not to contaminate bonding surface (sensing side of strain gage). Adhesive will not bond correctly to contaminated surface.

e. Apply a thin film of adhesive, approximately 3 to 5 mils thick, to sensing side of strain gage.

f. Position strain gage in locating fixture with sensing side facing wing lug.



Make sure all strain gage wires are flat against wing lug. Twisted wires may cause strain on the sensor.

g. Tape strain gage wires to wing structure clear of the bonding area, detail A.

h. Loosen capscrew (detail 17) and adjust clamp assembly (detail 5) until pad on bolt assembly (detail 6) is aligned over strain gage. Tighten cap screw (detail 17) to secure clamp assembly (detail 5) in this position.

i. Do null offset test:

(1) Apply 10 VDC across wire leads A - C using power supply. See figure 3.



Do not apply excess clamp pressure by over tightening bolt assembly. Damage to strain gage will occur.

NOTE

Do not allow null offset reading to exceed ± 2.5 millivolt (mV) from the pre-installed reading recorded on card.

(2) Apply clamping pressure to strain gage by tightening bolt assembly (figure 2, detail 6). Apply only enough clamping pressure to cause null offset reading to change ± 0.5 mV from pre-installed reading recorded on card. Record null offset reading on card.

(3) Monitor null offset reading for 15 minutes. Adjust the clamping pressure as required to maintain the last offset reading recorded on card.

j. Allow adhesive to cure 24 hours at 60° F minimum temperature.

k. After adhesive has cured, relieve clamping pressure on strain gage by loosening bolt assembly (detail 6).

NOTE

A steady increase or decrease in the null output is normal.

l. Slowly reapply clamping pressure to strain gage by tightening bolt assembly (detail 6) to get an identical null offset reading as recorded in step i(2).



Make sure no additional pressure is applied to the strain gage during removal of tooling fixture. Damage to strain gage will occur if excess pressure is applied.

m. Remove locating fixture from wing lug:

(1) Remove clamping pressure on strain gage by loosening bolt assembly (detail 6).

(2) Remove nuts (detail 16) from each end of stud (detail 8).



Be careful when removing locators from wing lug not to damage strain gage. Make sure no adhesive build-up exists that would cause difficulty in fixture removal.

(3) Carefully remove aft locator (detail 9) and forward locator (detail 10) from wing lug.

(4) Remove stud (detail 8) from wing lug attach pin.

NOTE

Make sure wire leads are bonded to the wing lug at least 0.25 inch from strain gage sensor.

n. Bond the strain gage wire leads to wing lug using EA956 adhesive. Cover wire leads completely with adhesive. Allow adhesive to cure one hour at 60° F minimum temperature.



Strain gage bond line must contain no voids. The strain gage will not operate correctly if voids exist.

o. Examine the adhesive squeeze out around strain gage bond line. If any visible voids exist, the strain gage must be removed and a new strain gage installed.

p. Do Application of Sealing Compound, this work package.

10. APPLICATION OF SEALING COMPOUND. See figure 1.

a. Sand all surfaces on inner wing structure where strain gage wire leads will be sealed, using abrasive cloth.



Isopropyl Alcohol

4

b. Clean bonding surface on inner wing structure using clean rymple cloth moistened with isopropyl alcohol.

NOTE

Do not allow isopropyl alcohol to evaporate on inner wing surface.

c. Immediately wipe surface dry with clean dry rymple cloth.



Sealing Compound

1



Sealing Compound

5

d. Prepare a suitable amount of sealing compound. Do sealant preparation and application procedures (A1-F18AC-SRM-200, WP011 00).

e. Apply fillet seal around all edges of strain gage.

f. Bond strain gage wire leads to wing lugs and inner wing structure using sealing compound, detail B.



Do not apply pressure to strain gage when applying sealing compound. Damage to strain gage will result if excess pressure is applied.

g. Completely embed strain gage and wire leads in sealing compound. Apply sealing compound over strain gage to a thickness of approximately 0.25 inch, detail C.

h. Allow sealing compound to air cure for 24 hours.

i. Do Final Aircraft Preparation, this work package.

11. FINAL AIRCRAFT PREPARATION. See figure 1.

a. Do retermination of strain gages (A1-F18AC-580-300, WP006 00).

b. Install ground wire.

c. Vacuum clean any loose debris from door 32L, 41L or 113L bays.

d. Reinstall attach pin caps:



Isopropyl Alcohol

4

(1) Clean caps and wing lug by wiping with clean rymple cloth moistened with isopropyl alcohol until no sign of residue remains on rymple cloth.

(2) Dry caps and wing lug using clean rymple cloth before isopropyl alcohol evaporates.



Technical Petrolatum

25

(3) Apply a thin film of petrolatum to mating surfaces of caps and wing lug.



Sealing Compound

1

(4) Prepare a suitable amount of sealing compound. Do sealant preparation and application procedures (A1-F18AC-SRM-200, WP011 00).

(5) Apply fay seal to mating surfaces of caps and wing lug using sealing compound.

(6) Position caps inline with attach pin and insert bolt from aft side of wing lug, detail A.

(7) Install washer and nut and torque nut 60 to 85 inch-pounds.

(8) Install cotter pin (QA).

(9) Fillet seal around bolt head and nut using sealing compound, detail D.

e. Apply finish system as required (A1-F18AC-SRM-500, WP012 00).

f. Reinstall fuel transfer adapter tube and refuel/de-fuel tube assemblies (A1-F18AC-460-300, WP043 00).

g. If removed, on 161353 THRU 161519, install leading edge flap servo valve and drive unit (A1-F18AC-570-300, WP035 00).

h. If removed, on 161520 AND UP, install leading edge flap servo valve and drive unit (A1-F18AC-570-300, WP036 01).

i. Install doors 34L, 41L, or 113L (A1-F18AC-LMM-010).

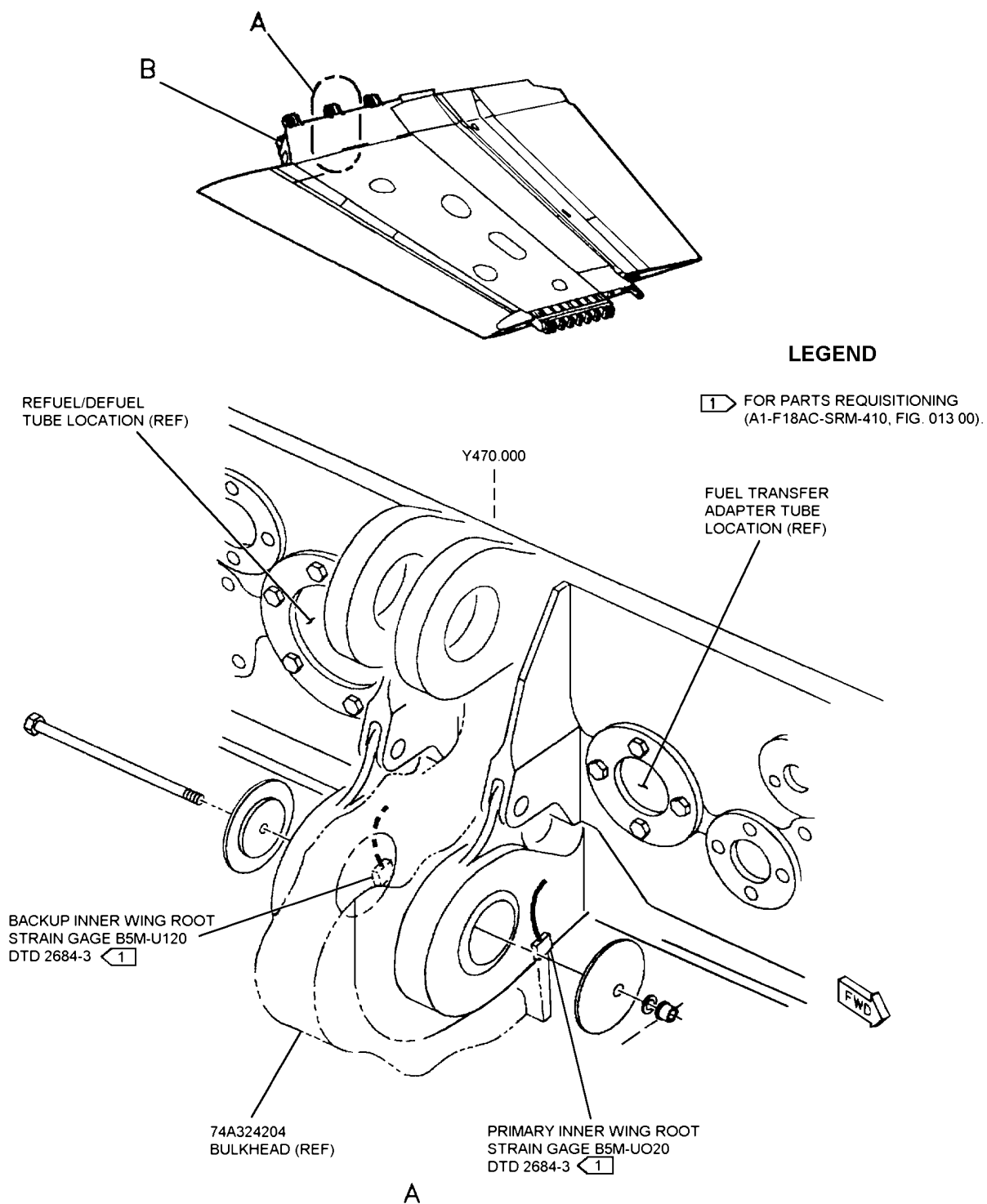


Figure 1. Wing Lug Strain Gages (Sheet 1)

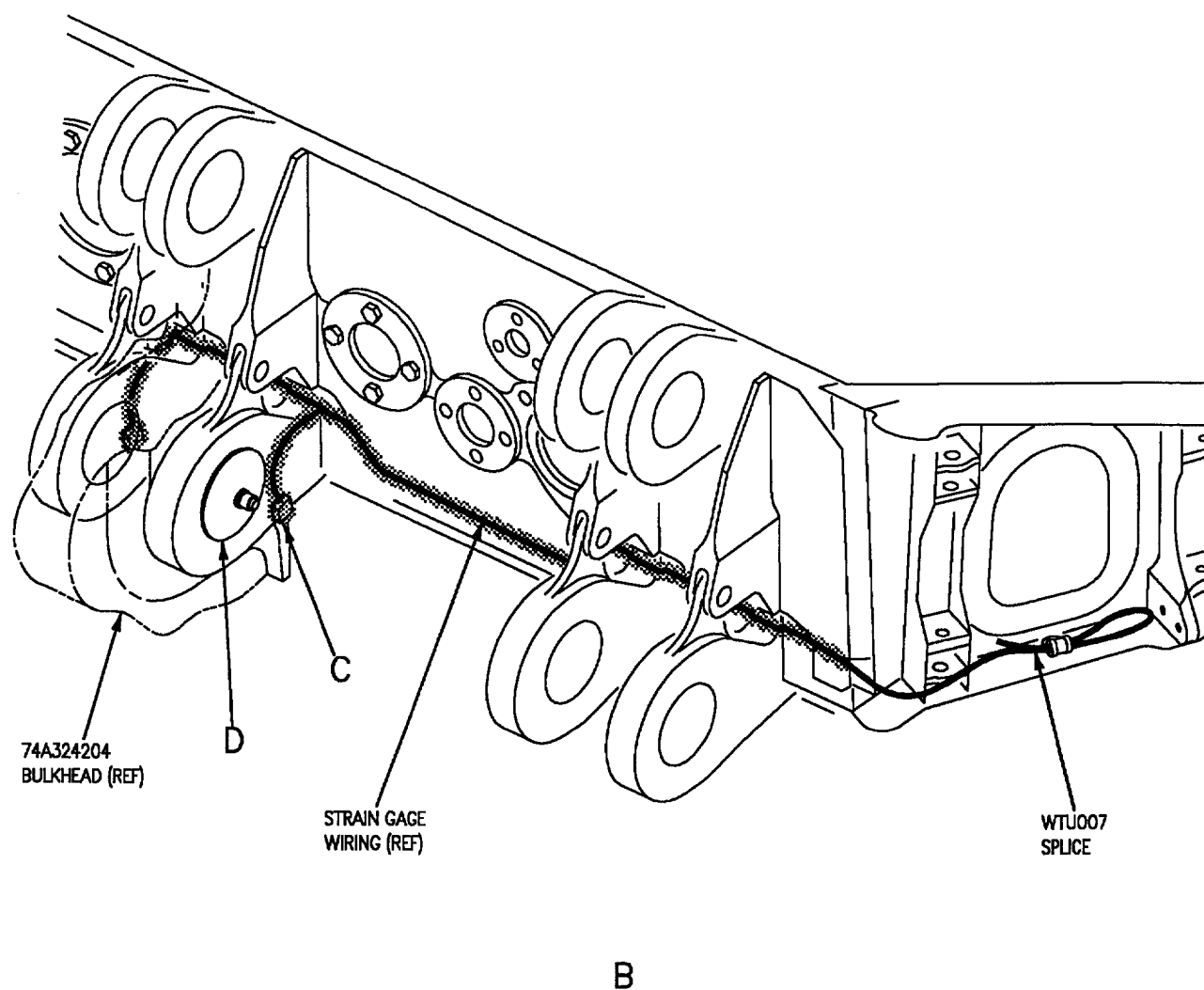
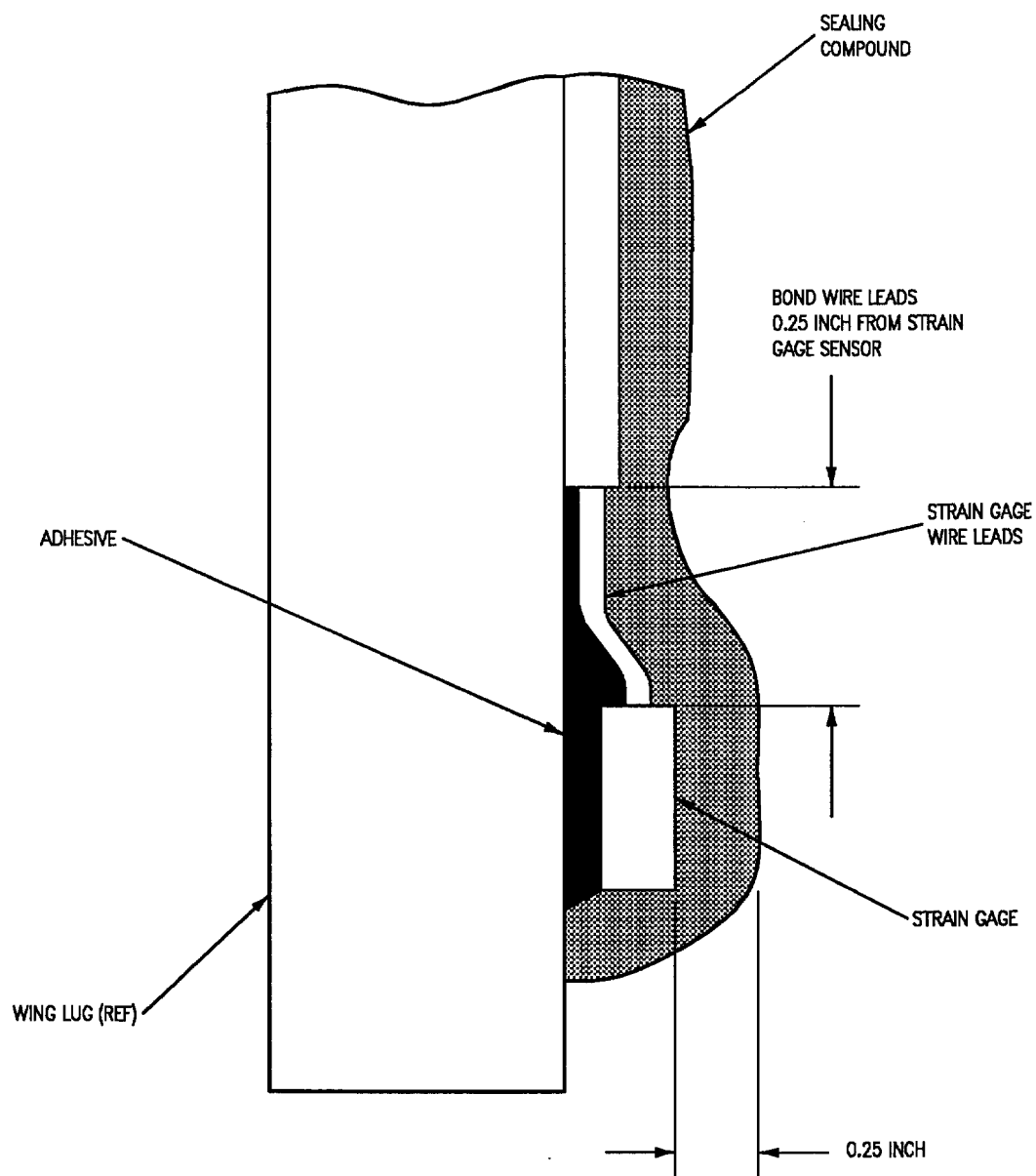


Figure 1. Wing Lug Strain Gages (Sheet 2)



C

Figure 1. Wing Lug Strain Gages (Sheet 3)

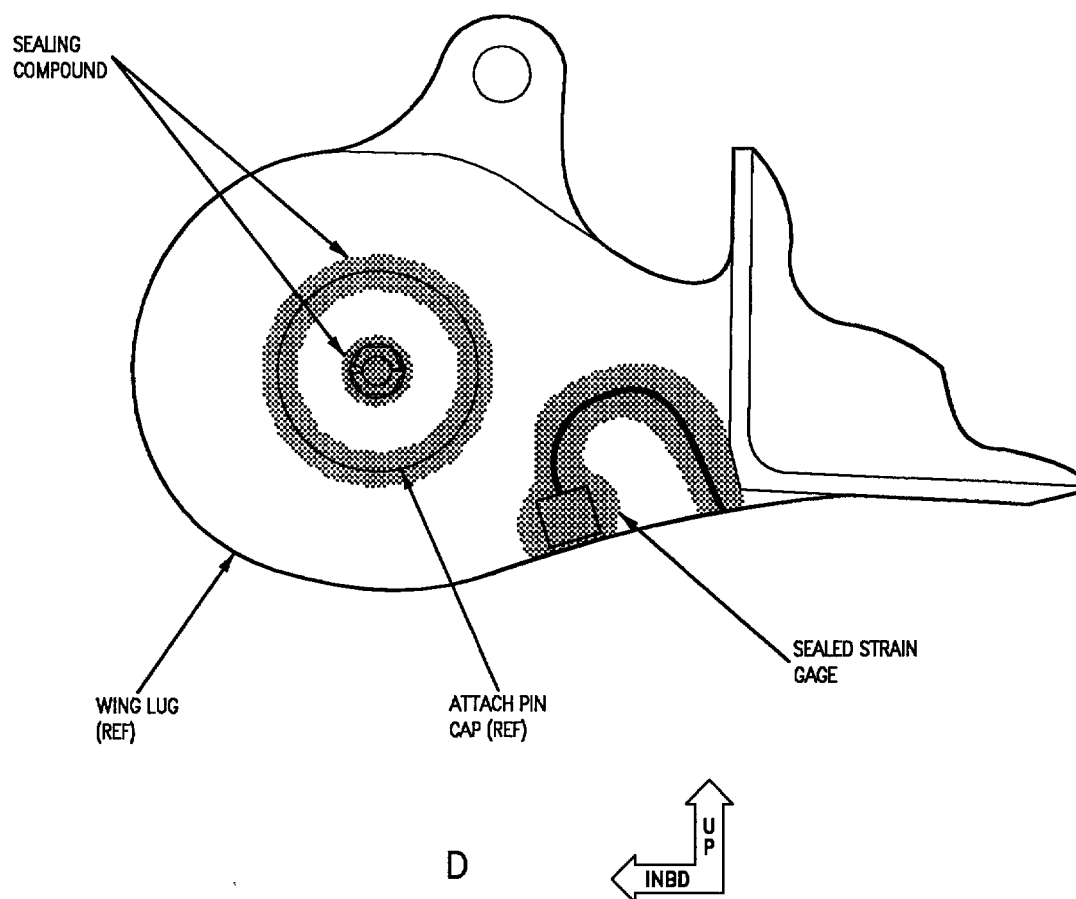


Figure 1. Wing Lug Strain Gages (Sheet 4)

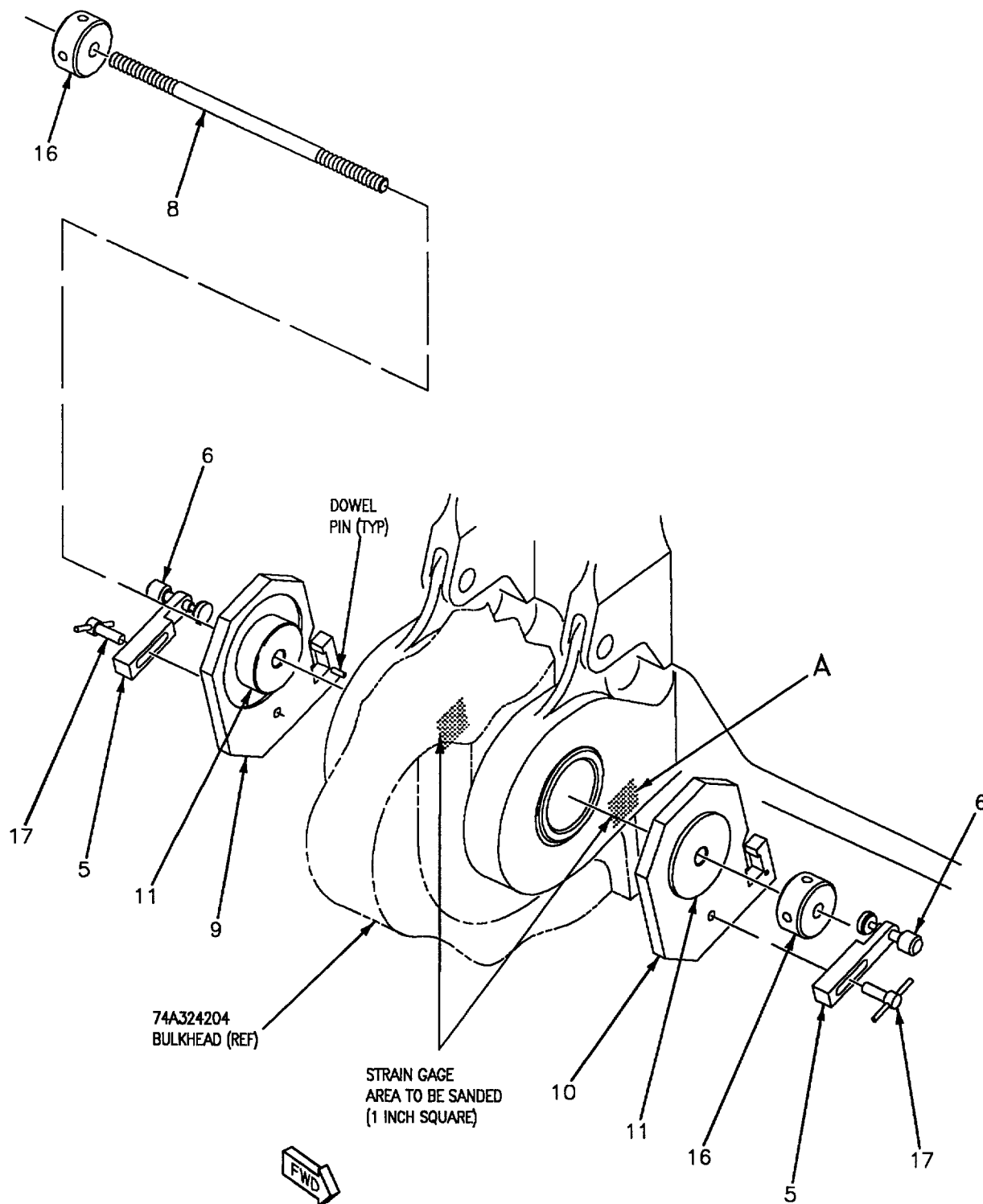


Figure 2. E92111 Strain Gage Bonding Fixture (Sheet 1)

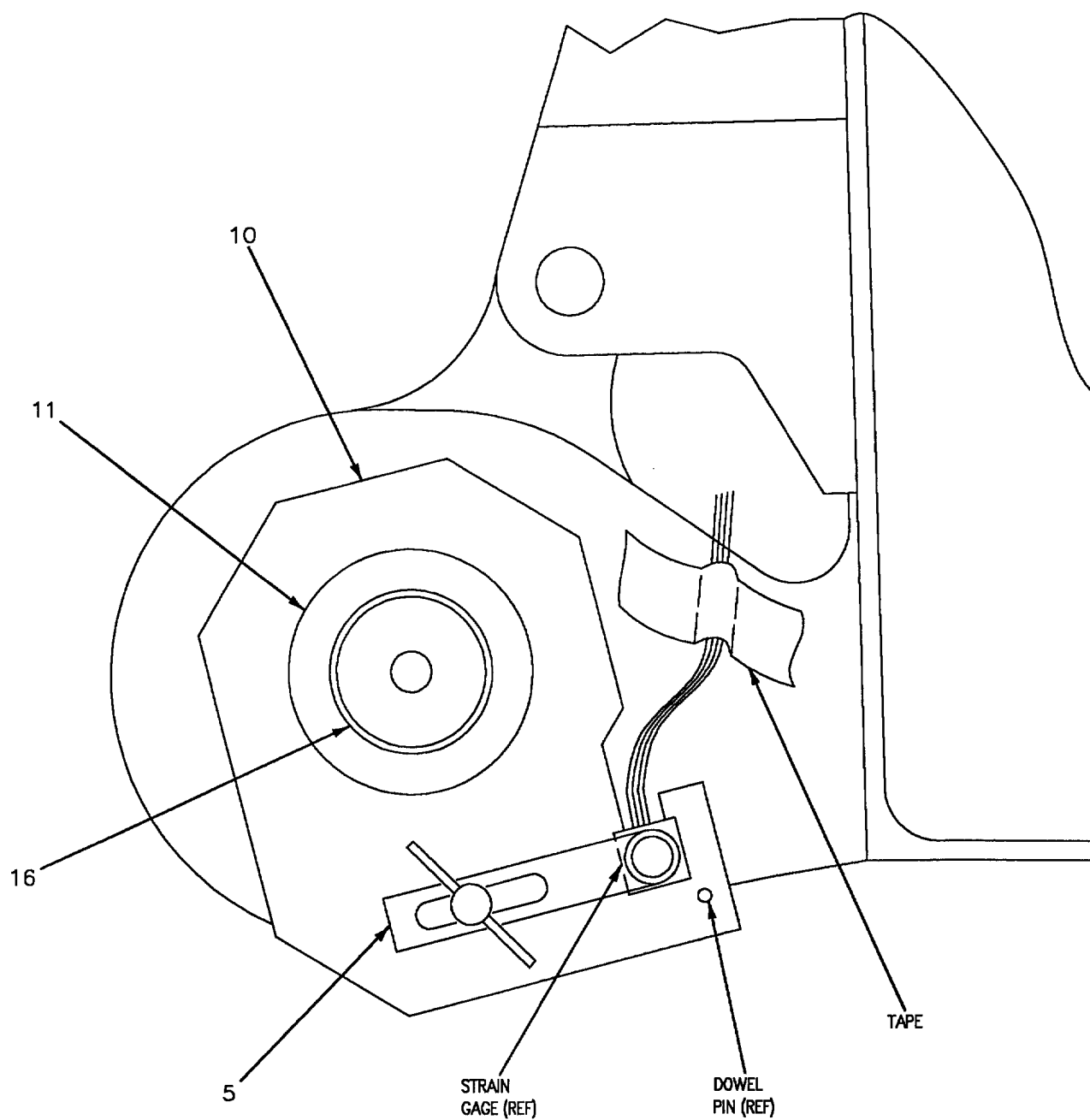


Figure 2. E92111 Strain Gage Bonding Fixture (Sheet 2)

Detail No.	Name	Function
5	Clamp Assembly	Houses components that provide clamping pressure to strain gage during bonding.
6	Bolt Assembly	Assembly made up of knob, threaded stud, plate and pad. When tightened, applies pressure to strain gage.
8	Stud	Threaded stud used with nuts to secure locator assemblies to wing lug.
9	Aft Locator Assembly	Locates and holds backup strain gage to aft surface of wing lug.
10	Forward Locator Assembly	Locates and holds primary strain gage to forward surface of wing lug.
11	Plug	Installs into wing attach pin and positions forward and aft locators in correct position.
16	Nut	Threads onto stud, securing locator assemblies to wing lug.
17	Cap Screw Assembly	Secures clamp assembly to forward and aft locators.

Figure 2. E92111 Strain Gage Bonding Fixture (Sheet 3)

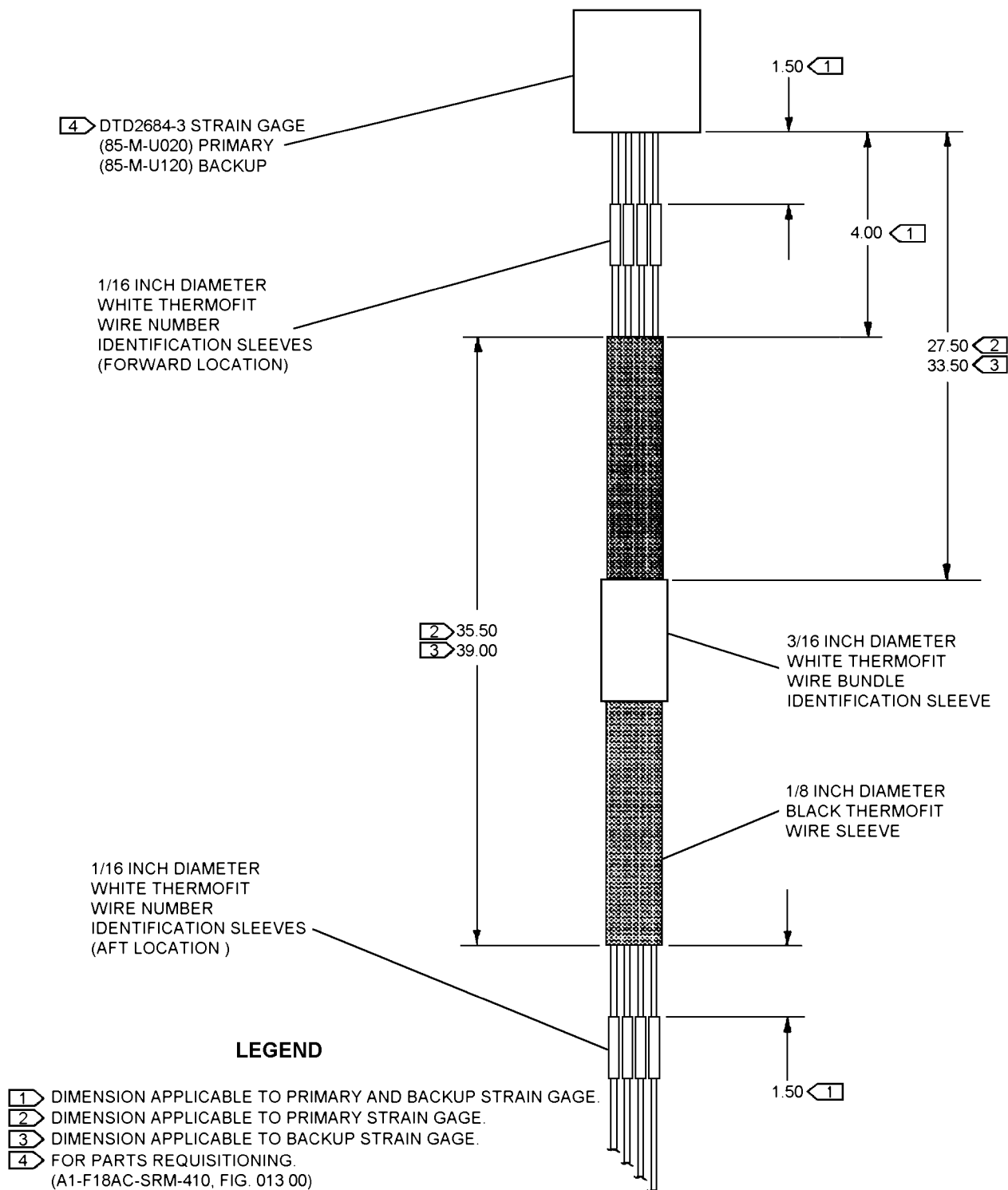


Figure 3. Strain Gage Wire Preparation

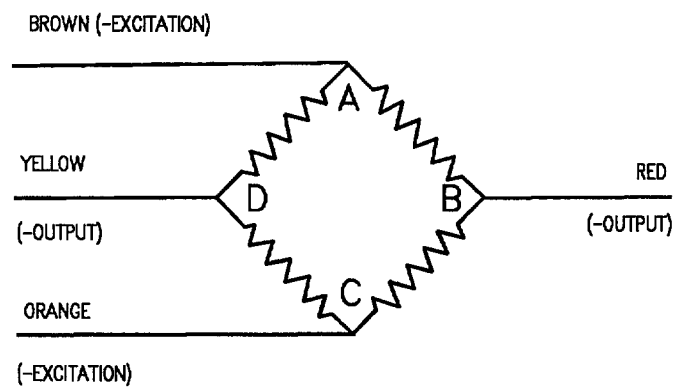


Figure 4. Resistance and Null Testing of New Strain Gage

INTERMEDIATE MAINTENANCE

STRUCTURE REPAIR

REPLACEMENT OF OUTER WING STRAIN GAGES

Reference Material

Aircraft Corrosion Control	A1-F18AC-SRM-500
Finish System	WP012 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Line Maintenance Procedures	A1-F18AC-LMM-000
Maintenance Status Display and Recording System	A1-F18AC-580-300
Strain Gages, Part No. DTD2684	WP006 00
Plane Captain Manual	A1-F18AC-PCM-000
Structure Illustrated Parts Breakdown-Wing	A1-F18AC-SRM-410
Structure Assy, Wing, Inner	FIG008 00
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Weapon Control System	A1-F18AC-740-300
Wing Tip Command Signal Encoder-Decoder KY-851/AYQ-9(V) (61A-U011 or 61A-V019)	WP007 00
Wiring Repair With Parts Data, General Wiring Repair Procedures	A1-F18AC-WRM-000
Installation Practices, Aircraft Electrical and Electronic Wiring	NAVAIR-01-1A-505

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Bonding Surface Preparation	3
E91903 Bonding Fixture Preparation	5
Final Aircraft Preparation	8
Preparation of Adhesive	5
Resistance and Null Testing of New Strain Gages	4
Strain Gage Installation	5
Strain Gage Wire Preparation	4

Record of Applicable Technical Directives

None

Support Equipment Required

Nomenclature	Part Number or Type Designation
Digital Multimeter	8840A/AA
Heat Gun	-
Megohmmeter, Portable	1863
Power Supply	6214A
Scale, Balance, Trip, 0.10 Gram Graduations	-
Scraper, Plastic	-
Strain Sensor Bonding Fixture Kit	160198-1
Torque Wrench, 0 to 120 Inch-Pounds	-
Vacuum Cleaner	-

Materials Required**NOTE**

Alternate item specifications or part numbers are shown in parentheses.

Nomenclature	Specification or Part Number
Adhesive	EA956
Cloth, Abrasive	AA1048TY1CL1, Grit 320
Cloth, Scrim, Nylon	Pattern 30
Cotter Pin	MS24665-153
Cup, Paper, Wax-Free	UU-C-806, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Nitrogen, Technical	BB-N-411, Type 1, Class 1, Grade A or B
Release Agent	Airtech A400
Rymple Cloth	AMS-3819
Scouring Powder	AA47
Sealing Compound	MIL-S-81733, Type 1/2 (MIL-S-83430)
Tape, Pressure Sensitive	A-A-883, Type 1, 1 1/2 Inch
Tape, Teflon	MIL-T-23594TY1-1.00

Materials Required (Continued)

Nomenclature	Specification or Part Number
Thermofit Sleeve, 1/16 Inch Diameter, Color White	M23053/5-102-9
Thermofit Sleeve, 3/16 Inch Diameter, Color Black	M23053/5-105-0
Thermofit Sleeve, 3/16 Inch Diameter, Color White	M23053/5-105-9
Tongue Depressor, Wooden Spatula	GG-D-226 226244, Type 1
Tubular Metal Braid #18 (72/36) T.C.	QQ-B-575
Water, Distilled	O-C-265

1. DESCRIPTION.**NOTE**

E91903 Bonding Fixture is part of 160198-1 Strain Sensor Bonding Fixture Kit.

2. Strain gages are sensitive fatigue monitoring units that measure the amount of stress a specific area is receiving. Located on the left lower outer wing skin at XW171.000 are primary and backup strain gages. The primary strain gage is bonded to the surface of the outer wing skin outboard of the backup strain gage and is spliced into the maintenance status display and recording system wiring. The backup strain gage is bonded to the surface of the outer wing skin inboard of the primary strain gage and is capped and stowed to be used if the primary strain gage fails. Procedures below provide for removal and installation of primary and backup strain gages. For strain gage part number requisitioning (A1-F18AC-SRM-410, Fig 008 00).

3. AIRCRAFT PREPARATION. See figure 1.

a. Make sure electrical and hydraulic power is off (A1-F18AC-LMM-000).

b. Make sure safety devices required for ground operations are installed (A1-F18AC-PCM-000).

c. Remove door 159L (A1-F18AC-LMM-010).

d. Remove left Wing Tip Command Signal Encoder-Decoder KY-851/AYQ-9(V) (A1-F18AC-740-300, WP007 00).



Be careful when removing strain gages not to damage composite surface of wing skin.

e. Remove primary and backup strain gages from lower surface of outer wing skin using scraper, detail A.

f. Remove ground wire and disconnect strain gage at wire bundle splice WTU004 located in door 159L bay, detail A.

NOTE

Strain gages are not reusable.

g. Pull strain gage lead wiring from sealant, remove wires from clamps, and dispose of gages.

h. Remove any residual sealant from wing skin using plastic scraper. Abrasive cloth may be required for complete removal of adhesive.

i. Do Bonding Surface Preparation, this work package.

4. BONDING SURFACE PREPARATION. See figure 2.

a. Remove any residual adhesive and/or sealant, remaining from previously installed strain gages, using a plastic scraper. Abrasive paper may be required for complete removal of adhesive.



Isopropyl Alcohol

4

b. Degrease wing skin surface using clean rymple cloth moistened with isopropyl alcohol.

NOTE

Do not allow isopropyl alcohol to evaporate on wing skin surface before wiping.

c. Immediately wipe surface dry with clean dry rymple cloth.

d. Locate masking template (detail 17) on lower skin. Align edges of template with skin inboard and aft trim lines, detail A.

NOTE

Cutout in template indicates surface preparation area.

e. Mark area of cutout on skin using pencil.

f. Remove masking template (detail 17) from lower skin.

g. Mask around marked area using tape.



Be careful when sanding skin not to damage composite surface of wing skin.

NOTE

Do not sand in circular motion.

h. Wet sand, in perpendicular directions, masked area on wing skin using abrasive cloth and distilled water.

i. Remove sanding residue using clean rymple cloth moistened with distilled water.

j. Scour bonding surface on wing skin using non-chlorinated scouring powder and clean rymple cloth moistened with distilled water.

k. Repeat steps h, i, and j to make sure clean bonding surface exists on wing skin.

l. Remove all scouring residue using clean rymple cloth moistened with distilled water.

m. Check for a water-break free surface by spraying a small amount of distilled water onto wing skin bonding surface. If water breaks or balls up, instead of remaining continuous, repeat steps h thru m.



Nitrogen

23

NOTE

Bonding surface can be force dried using dry, oil-free nitrogen or other inert gas.

n. Allow bonding surface to air dry.

o. Do Strain Gage Wire Preparation, this work package.

5. STRAIN GAGE WIRE PREPARATION. See figure 3.



The strain gage is a delicate electrical device. Use care when handling to avoid damage.

a. Mark wire numbers on 1/16 inch diameter white thermofit sleeves (NAVAIR 01-1A-505). For wire number identification (A1-F18A()-WRM-000).

b. Mark wire bundle number on 3/16 inch diameter white thermofit sleeve (NAVAIR 01-1A-505). For wire bundle number identification (A1-F18A()-WRM-000).

c. Cut a piece of 5/64 inch diameter tubular metal braid to dimension shown on figure.

d. Cut a piece of 3/16 inch diameter black thermofit sleeving to dimension shown on figure.



Do not apply heat directly to strain gage. Damage to strain gage will occur if excessive heat is applied to sensor end.

e. Heat shrink forward wire number identification sleeves to dimension shown of figure (NAVAIR 01-1A-505). For correct wire number to wire color identification (A1-F18A()-WRM-000).

f. Wrap wire leads with teflon tape to dimension shown on figure.

g. Install metal braid over teflon tape as shown on figure.

NOTE

Keep strain gage wire leads flat 3 inches from wire exit side of sensor when shrinking 3/16 inch diameter thermofit sleeving.

h. Cover metal braid with 3/16 inch diameter thermofit sleeving and heat shrink to dimension shown on figure (NAVAIR 01-1A-505).

i. Heat shrink wire bundle identification sleeve to dimension shown on figure (NAVAIR 01-1A-505).

j. Heat shrink aft wire number identification sleeves to dimension shown on figure (NAVAIR 01-1A-505). For correct wire number to wire color identification (A1-F18A()-WRM-000).

k. Do Resistance and Null Testing of New Strain Gage, this work package.

6. RESISTANCE AND NULL TESTING OF NEW STRAIN GAGE. See figure 4.

a. Do resistance test using a portable megohmmeter. Resistance between wire leads shall be approximately as listed below:

(1) Wire leads B - D should equal 980 to 1020 ohms.

(2) Wire leads A - C should equal 980 to 1020 ohms.

NOTE

Resistance test between wire leads A - GROUND is not applicable when testing new strain gage before installation.

(3) Wire leads A - GROUND should equal 500K ohms minimum.

b. Do null test using digital multimeter and power supply unit:

NOTE

Record all null test readings for each strain gage on attached card. Keep card attached to strain gage until strain gage is installed and final null offset test is completed.

(1) Position sensing side of strain gage on clean flat stainless steel plate surface.

(2) Place a 75 gram weight on strain gage.

(3) Apply 10 VDC across wire leads A - C.

(4) Read millivolt (mV) output across wire leads B - D. Acceptable reading is from +10mV to -10mV. Record reading on card.

c. Do Bonding Fixture Preparation, this work package.

7. E91903 BONDING FIXTURE PREPARATION. See figure 2.

a. Retract swivel clamp assembly (detail 7) as required to allow bonding fixture to be installed, detail B.

b. Retract foot assembly (detail 6), by loosening screw, as required to allow bonding fixture to be installed, detail B.

c. Remove pins (details 4 and 5), detail B.



Release Agent

24



Release agent must be sprayed onto the tooling fixture away from the aircraft to prevent the possibility of release agent contacting the bonding surfaces on wing lugs.

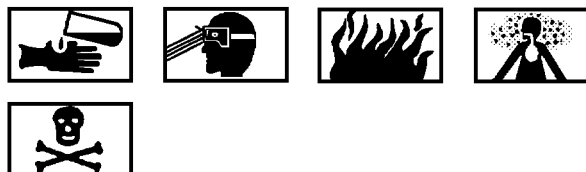
NOTE

Allow 5 minutes of dry time between coats of release agent.

d. Spray apply two coats of release agent on surfaces of foot assembly (detail 6) and blocks (detail 18) which will face the wing skin surface and come in contact with adhesive.

e. Do Preparation of Adhesive, this work package.

8. PREPARATION OF ADHESIVE.



Adhesive

20

NOTE

Adhesive has a pot life of 45 minutes. Do not mix more material than can be used in 30 minutes. The amount in step a is more than is needed to bond two strain gages. The amount in step a may be increased or decreased by multiplying or dividing each part by the same number.

a. Combine by weight 100 parts of part A with 58 parts of part B of adhesive.

b. Mix parts A and B, using tongue depressor, in a wax free non-absorbent paper cup to a uniform consistency leaving no unmixed material around edges of cup.

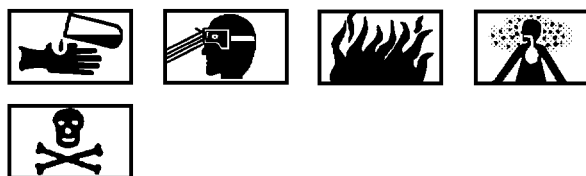
NOTE

Make sure no air bubbles appear in adhesive.

c. Do Strain Gage Installation, this work package.

9. STRAIN GAGE INSTALLATION. See figure 2.

a. Cut 1 inch square piece of nylon cloth (scrim cloth) for each strain gage.



Adhesive

20

NOTE

Reclean bonding surface of wing skin per paragraph 4, steps e thru k, if adhesive is not applied within 30 minutes after surface preparation.

b. Apply a thin film of adhesive, approximately 3 to 5 mils thick, to bonding surfaces of wing skin. Rub adhesive firmly onto surfaces using plastic spatula.

NOTE

Make sure scrim cloth is wet with adhesive after being positioned.

c. Apply scrim cloth over adhesive.

d. Install bonding fixture on outer wing:

(1) Locate bonding fixture in position under wing, detail B.

(2) Install pin (detail 4) through forward tab of bonding fixture and into 74A150747 support assembly, detail B.

(3) Install pin (detail 5) through outboard aft tab of bonding fixture, 74A150748 support assembly, and into inboard aft tab of bonding fixture, detail B.

(4) Snug foot assembly (detail 6) up against skin surface and tighten screw, detail B.

(5) Position blocks (detail 18) on swivel clamp assembly (detail 7), detail B.



Be careful when handling strain gage not to contaminate bonding surface (sensing side of strain gage). Adhesive will not bond correctly to contaminated surface.

e. Apply a thin film of adhesive, approximately 3 to 5 mils thick, to sensing side of strain gage.

f. Position strain gages in foot assembly (detail 6) with sensing side facing wing skin.

g. Tighten swivel clamp assembly (detail 7), by hand, to secure strain gages in foot assembly (detail 6) against skin surface, detail C.



Make sure all strain gage wires are flat against skin surface. Twisted wires may cause strain on sensors.

h. Tape strain gage wires to wing skin in line with forward wire bundle, detail C.

i. Tie strain gage wires to wire bundle near clamp (figure 1, detail A).

j. Do null offset test:

(1) Apply 10 VDC across wire leads A - C using power supply. See figure 3.



Do not apply excess clamping pressure by over tightening swivel clamp assembly. Damage to strain gage will occur.

NOTE

Do not allow null offset reading to exceed ± 2.5 millivolt (mV) from the pre-installed reading recorded on card.

(2) Apply clamping pressure to strain gage by tightening swivel clamp assembly (detail 7), figure 2, detail C. Apply only enough clamping pressure to cause null offset reading to change ± 0.5 mV from pre-installed reading recorded on card. Record null offset reading on card.

(3) Monitor null offset reading for 15 minutes. Adjust the clamping pressure as required to maintain the last offset reading recorded on card.

k. Allow adhesive to cure 24 hours at 60°F minimum temperature.

l. After adhesive has cured, relieve clamping pressure on strain gage by loosening swivel clamp assembly (detail 7), detail C.

NOTE

A steady increase or decrease in the null output is normal.

m. Slowly reapply clamping pressure to strain gage by tightening swivel clamp assembly (detail 7) to get an identical null offset reading as recorded in step h(2).



Make sure no additional pressure is applied to the strain gage during removal of bonding fixture. Damage to strain gage will occur if excess pressure is applied.

n. Remove bonding fixture from outer wing:

(1) Remove clamping pressure on strain gage by loosening swivel clamp assembly (detail 7) to retracted position, detail B.



Be careful when removing fixture from outer wing not to damage strain gages. Make sure no adhesive build-up exists that would cause difficulty in fixture removal.

(2) Remove blocks (detail 18) from swivel clamp assembly (detail 7), detail B.

(3) Loosen screw and carefully retract foot assembly (detail 6) away from wing skin and strain gages, detail B.

(4) Remove pins (details 4 and 5) and lower bonding fixture away from outer wing, detail B.

NOTE

Make sure wire leads are bonded to the wing lug at least 0.25 inch from strain gage sensor.

o. Bond the strain gage wire leads to wing skin using adhesive. Cover wire leads completely with adhesive. Allow adhesive to cure one hour at 60°F minimum temperature.



Strain gage bond line must contain no voids. The strain gage will not operate correctly if voids exist.

p. Examine the adhesive squeeze out around strain gage bond line. If any visible voids exist, the strain gage must be removed and a new strain gage installed.

q. Do Application of Sealing Compound, this work package.

10. APPLICATION OF SEALING COMPOUND. See figure 1.

a. Sand all surfaces on outer wing where strain gage wire leads will be sealed, using abrasive cloth.



Isopropyl Alcohol

4

b. Clean bonding surface on outer wing using clean rymple cloth moistened with isopropyl alcohol.

NOTE

Do not allow solvent to evaporate on outer wing surface.

c. Immediately wipe surface dry with clean dry rymple cloth.



Sealing Compound

1



Sealing Compound

5

d. Prepare a suitable amount of sealing compound. Do sealant preparation and application procedures (A1-F18AC-SRM-200, WP011 00).

e. Apply fillet seal around all edges of strain gage.

f. Bond strain gage wire leads to outer wing skin using sealing compound, detail A.



Do not apply pressure to strain gage when applying sealing compound. Damage to strain gage will result if excess pressure is applied.

Make sure sealing compound is not more than 0.25 inch thick. Interference with equipment installation may occur.

g. Completely embed strain gage and wire leads in sealing compound. Apply sealing compound over strain gage to a thickness of approximately 0.25 inch, detail B.

h. Allow sealing compound to air cure for 24 hours.

i. Do Final Aircraft Preparation, this work package.

11. **FINAL AIRCRAFT PREPARATION.** See figure 1.

a. Do retermination of strain gages (A1-F18AC-580-300, WP006 00).

b. Install ground wire.

c. Clean any loose debris from door 159L bay.

d. Apply finish system as required (A1-F18AC-SRM-500, WP012 00).

e. Reinstall left Wing Tip Command Signal Encoder-Decoder KY-851/AYQ-9(V) (A1-F18AC-740-300, WP007 00).

f. Install door 159L (A1-F18AC-LMM-010).

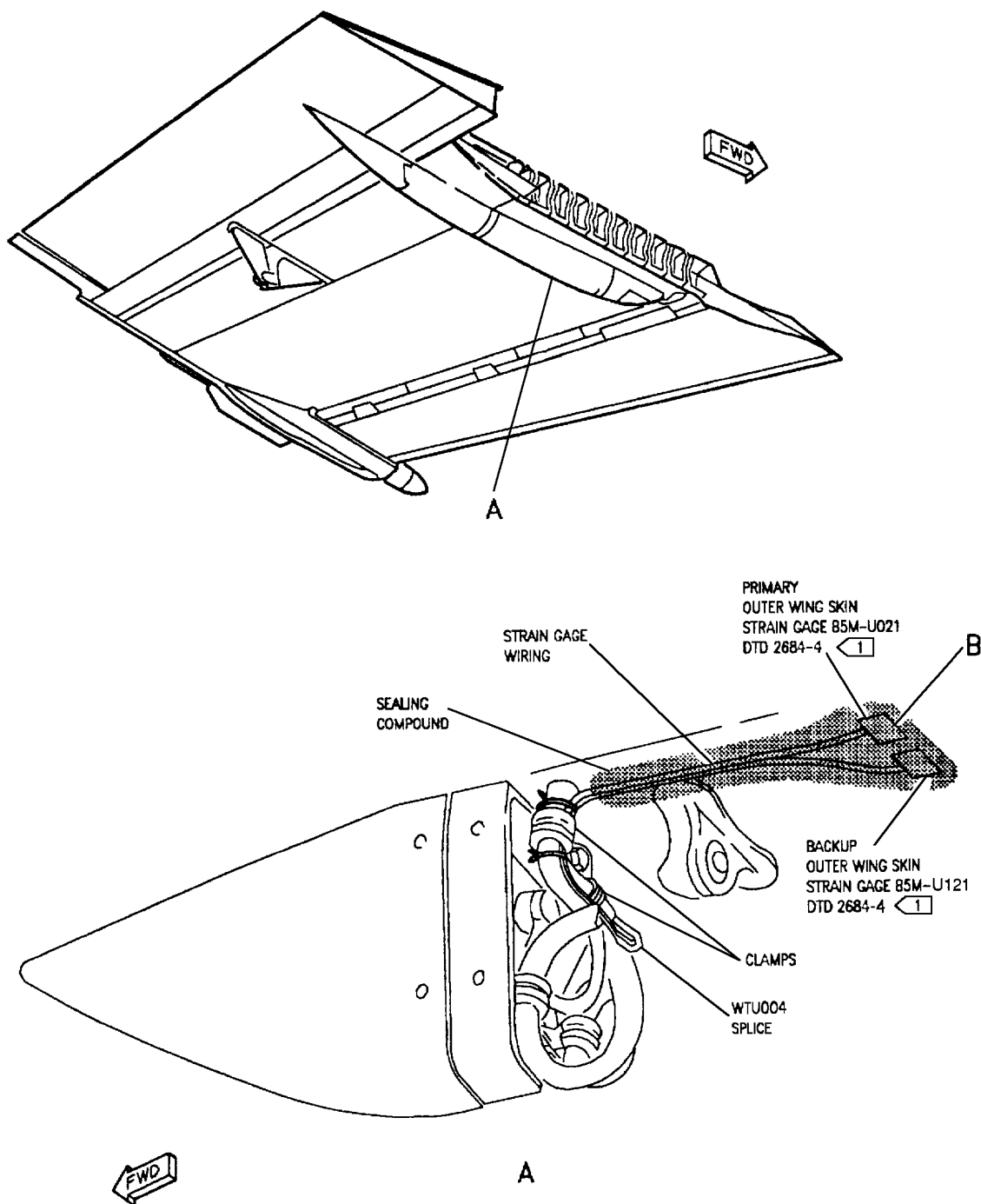
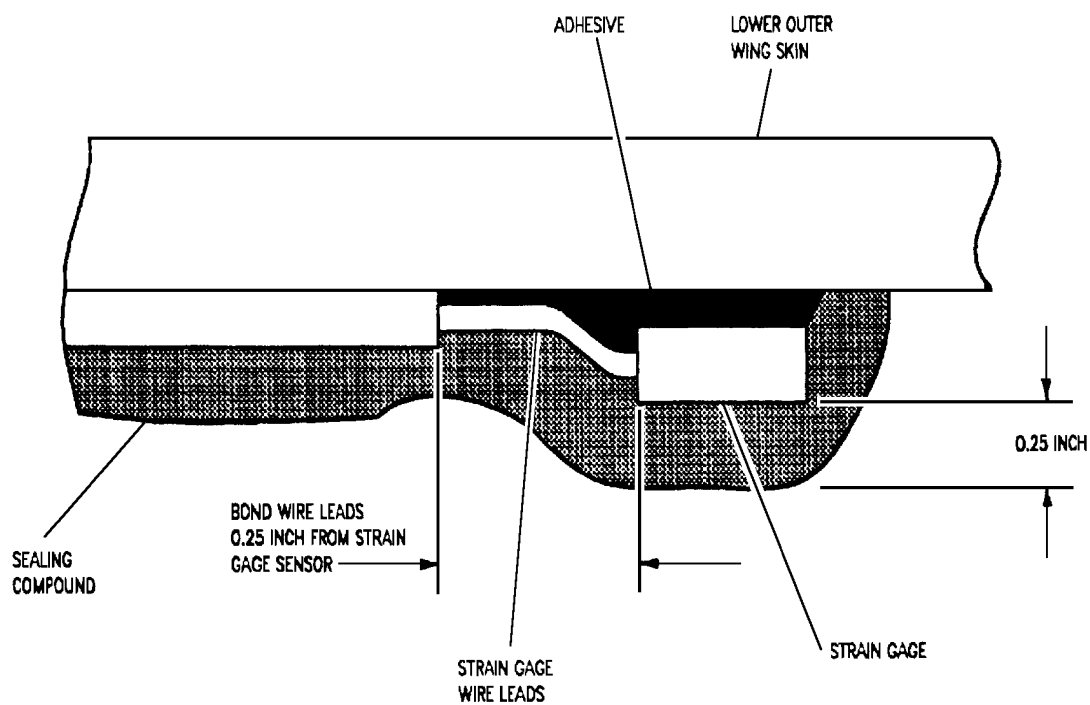


Figure 1. Outer Wing Strain Gages (Sheet 1)



B

LEGEND

1 FOR PARTS REQUISITIONING
(A1-F18AC-SRM-410, FIG. 008 00)

Figure 1. Outer Wing Strain Gages (Sheet 2)

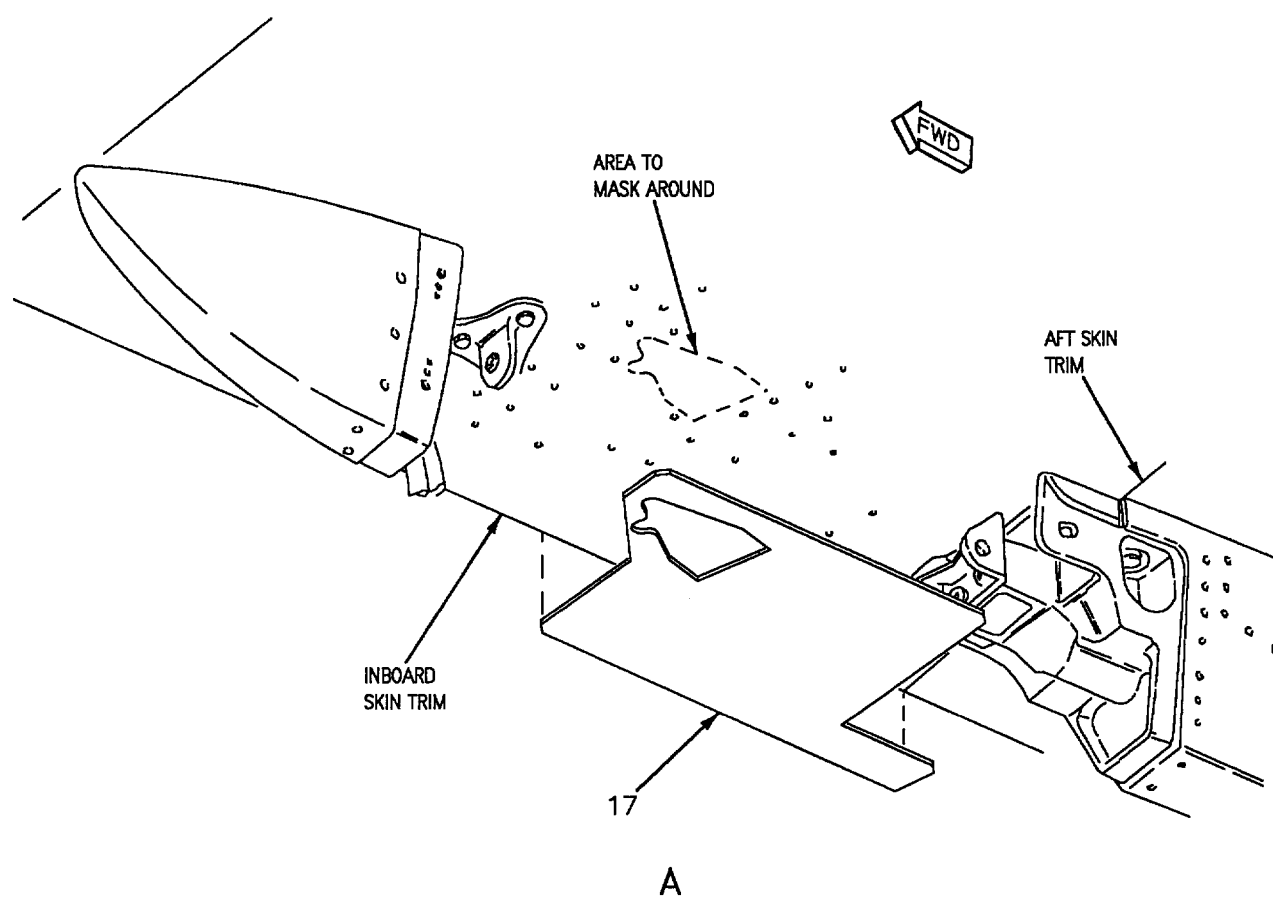


Figure 2. E91903 Strain Gage Bonding Fixture (Sheet 1)

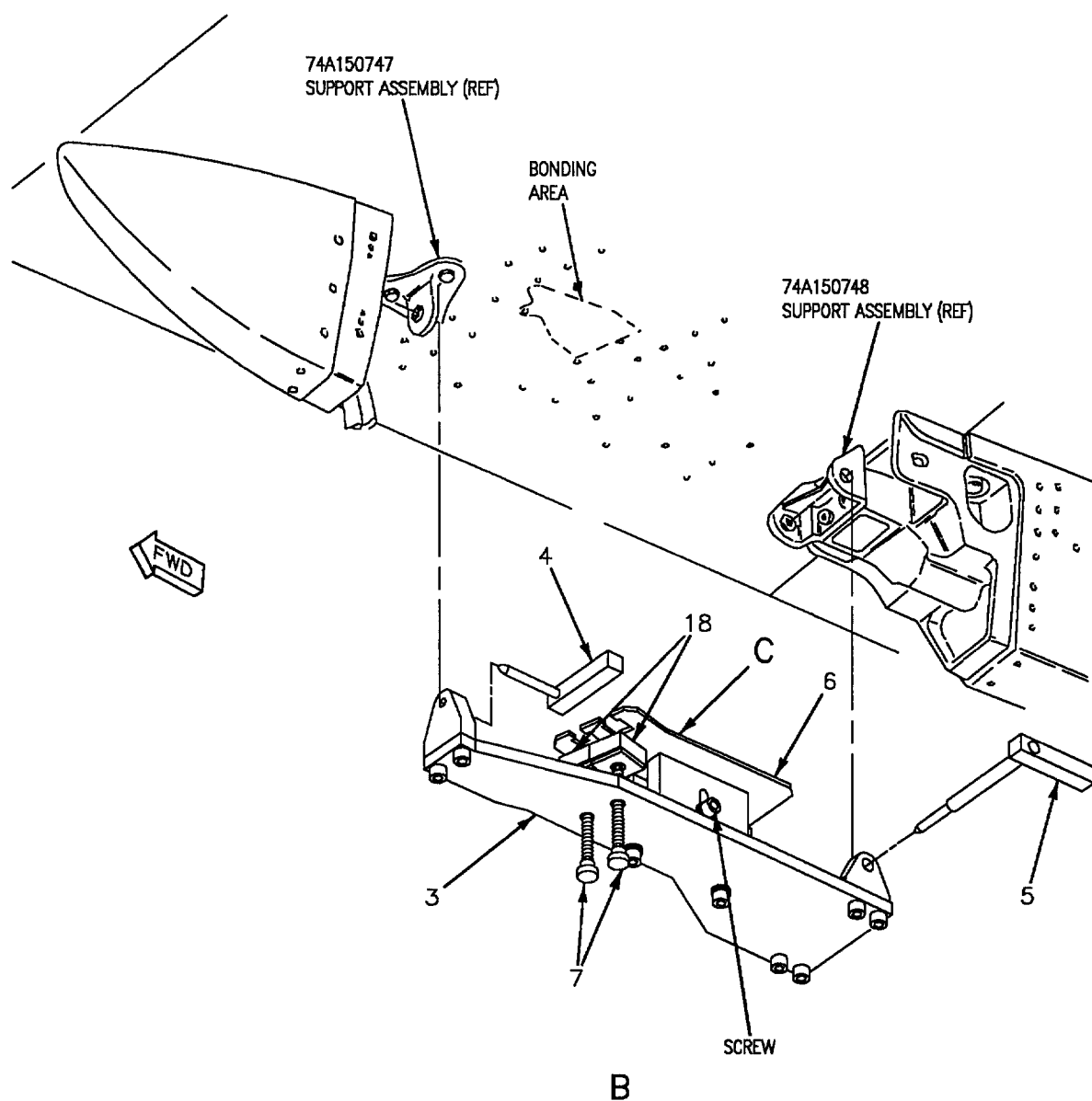


Figure 2. E91903 Strain Gage Bonding Fixture (Sheet 2)

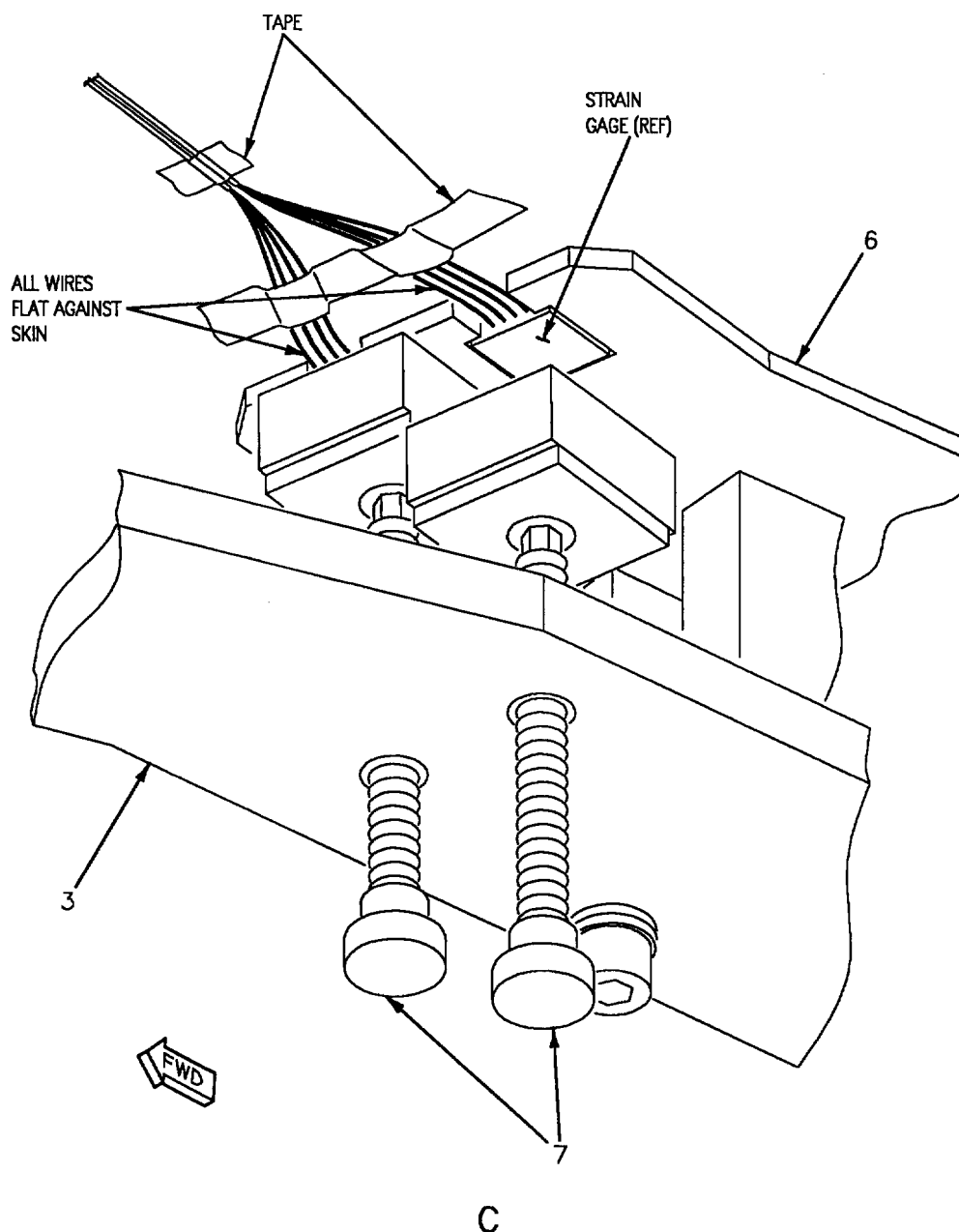


Figure 2. E91903 Strain Gage Bonding Fixture (Sheet 3)

Detail No.	Name	Function
3	Frame Assembly	Main support for all details of bonding fixture.
4	Pin	Pins forward part of bonding fixture to 74A150747 support assembly.
5	Pin	Pins aft part of bonding fixture to 74A150748 support assembly.
6	Foot Assembly	Used to secure bonding fixture in position against skin surface, and correctly locate strain gages in position.
7	Swivel Clamp Assembly	Provides clamping pressure to strain gages during bonding.
17	Masking Template	Used to make bonding area for masking before surface preparation.
18	Block	Sits on swivel clamp assembly and holds strain gage against skin surface during bonding.

Figure 2. E91903 Strain Gage Bonding Fixture (Sheet 4)

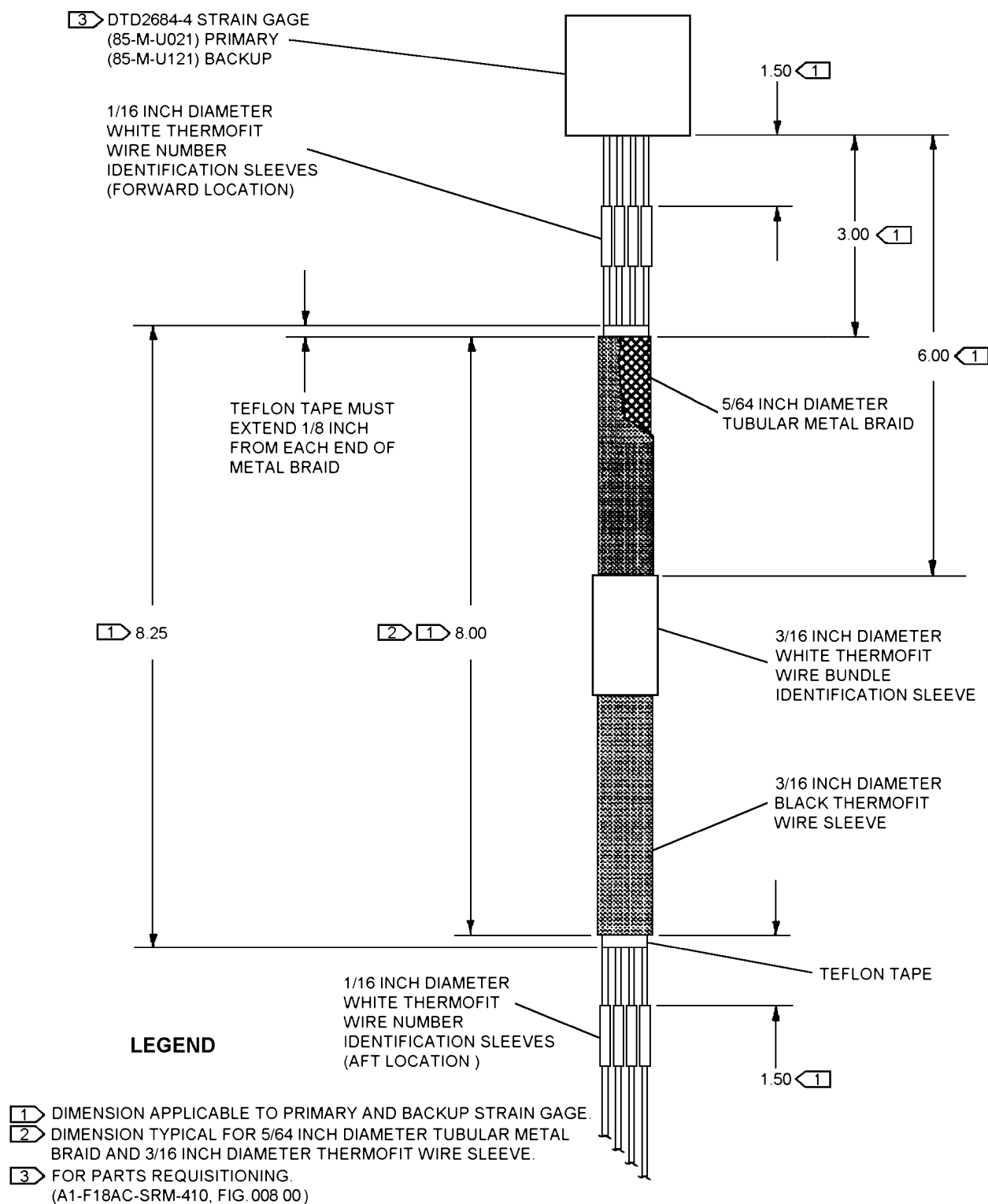


Figure 3. Strain Gage Wire Preparation

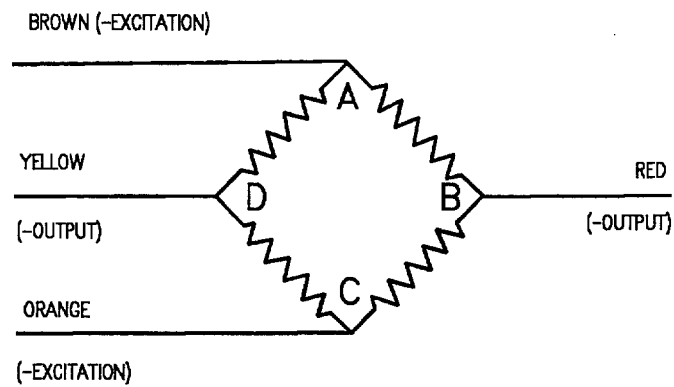


Figure 4. Resistance and Null Testing of New Strain Gage

ORGANIZATIONAL AND INTERMEDIATE MAINTENANCE

STRUCTURE REPAIR

EXTERNAL FUEL TANK, ELLIPTICAL

PART NO. 74A550000

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
External Fuel Tank, Elliptical, Part No. 74A550000, Survivability Wrap	
Class I thru VII Damage Repair	WP024 01
External Fuel Tank, Elliptical, Part No. 74A550000, Survivability Wrap	
Class VIII thru X Damage Repairs	WP024 02
External Fuel Tank, Elliptical, Part No. 74A550000, Metal Repair	WP024 04
Aircraft Corrosion Control	A1-F18AC-SRM-500
Elliptical External Fuel Tank, 74A550000, Finish System and Markings	WP047 00
Structure Repair, Typical Repair	A1-F18AC-SRM-250
Water Removal	WP005 00
Aluminum, Graphite Epoxy, or Titanium Patch Installation and Removal	WP007 00
Aircraft Weapons System Cleaning and Corrosion Control	NAVAIR 01-1A-509

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Negligible Damage	2
Repairable Damage	2
Repairs	3
Replacements	6
Survivability Wrap	3
Damage Evaluation	3
Negligible Damage	3
Repairable Damage	3
Repairs	6

Record of Applicable Technical Directives

None

Support Equipment Required

None

Materials Required

None

1. METAL SKIN AND STRUCTURE.

2. **DAMAGE EVALUATION.** See figure 1. Damage is classified as negligible and repairable. The types of materials used are shown on figure 1. Repair zones are shown on figure 2. Locating and determining size of damage by visual method is organizational maintenance. Damage not listed or exceeding the limits below require a depot engineering disposition.

3. **Negligible Damage.** Negligible damage is damage that may be allowed to exist as is. However preventive maintenance, for temporary corrosion arrestment, should be done to scratches (NAVAIR 01-1A-509). Type and limits are:

a. Dents.

- (1) Smooth dents only.
- (2) No more than 0.080 inch in depth.
- (3) Diameter is not more than 0.080 inch.
- (4) Scratches allowed up to 0.001 inch in depth.

b. Scratches, nicks, and gouges.

- (1) No more than 0.001 inch depth.
- (2) Length is no more than 2.5 inches in zone I.
- (3) Length is no more than 5.5 inches in zone II.
- (4) Length is no more than 9.5 inches in zone III.

4. **Repairable Damage.** Repairable damage is damage that can be permanently repaired with no adverse effect on structural integrity, flight characteristics, or safety of the tank. Types and limits:

a. Smooth dents exceeding negligible damage limits are repaired per to tables 1 and 2.

b. Smooth dents not exceeding the limits under negligible damage, containing scratches, nicks, gouges, or corrosion.

(1) Scratches, nicks, gouges, or corrosion may be blended to the maximum depth of 0.006 inch.

(2) Damage exceeding the limits listed above are repaired per tables 1 and 2.

c. Dents with sharp corners, punctures, deep abrasions, cracks, and gouges are repaired per tables 1 and 2.

d. Scratches, Nicks, and Gouges.

(1) Blend damage not exceeding 0.006 inch in depth.

(2) Damage exceeding the limits listed above are repaired per tables 1 and 2.

e. Cracks are repaired per tables 1 and 2.

f. Punctures are repaired per tables 1 and 2.

g. Corrosion.

(1) Arrest corrosion that is less than 0.006 inch in depth and 2 inches in diameter zone I (NAVAIR 01-1A-509).

(2) Arrest corrosion that is less than 0.006 inch in depth and 5 inches in diameter in zone II (NAVAIR 01-1A-509).

(3) Arrest corrosion that is less than 0.006 inch in depth and 9 inches in diameter in zone III (NAVAIR 01-1A-509).

(4) Repair corrosion that exceeds the limits listed above per tables 1 and 2.

Table 1. Preferred Repair Procedures





Damage Size Limits		
Zone	Repair Procedure	Maximum Size
I	Replace Cone	NA
II	One  Two 	1.5 Inches Length 1.5 Inches Diameter
III	Three	2.5 Inches Diameter
NOTES  Scratch, nick, gouge, and crack only.  All other damages.		

Table 2. Alternate Repair Procedure

Damage Size Limits			
Zone	Repair Procedure	Maximum Size	Minimum Size
III	Four	6 Inches by 4.25 Inches	2.25 Inches by 0.50 Inches



Do not weld within the hardback area or within 3.5 inches of the frames centerline. Welding in these areas will cause damage.

5. **REPAIRS.** See figure 2 for repair zones. Refer to WP022 04 for repair of aluminum skins free of structure.

6. SURVIVABILITY WRAP.

7. **DAMAGE EVALUATION.** Damage is classified as negligible and repairable. Repair zones are shown on figure 2. Locating and determining size of damage by visual and coin tapping method is organizational maintenance. Locating and determining size of damage, and presence of moisture in core by NDI method is intermediate maintenance. Damage not listed or exceeding the limits below requires a depot engineering disposition.

8. **Negligible Damage.** See figure 3. Negligible damage may be allowed to exist as is. Type and limits are:

a. Dents.

(1) No breaks or cracks in surface.

(2) Less than 1 inch in diameter.

(3) Maximum of three dents in a 12 inch diameter circle.

(4) Minimum spacing between dents is three diameters of the largest dent edge to edge.

b. Delamination or unbonds.

(1) Less than 1 inch in diameter.

9. **Repairable Damage.** See figure 4. Repairable damage is damage that can be permanently repaired with no adverse affect on structural integrity, flight characteristics, or safety of aircraft.

10. **Minor Surface Finish Defects, Class I Damage.** Class I damage does not require immediate repair, but shall be repaired as soon as practical. Class I damage is:

a. Dents, scratches, pits, erosion, or abrasions.

(1) Damage not into fiberglass laminate.

11. **Outer Fiberglass Laminate Surface Ply Damage, Class II Damage.** See figure 4, section A. Class II damage is:

a. Dents, cuts, scratches, pits, erosion, or abrasions.

(1) Depth is not more than 0.01 inch in zones I and II.

(2) Depth is not more than 0.005 in zone III.

(3) Depth does not include surface finish or sealing materials.

12. **Outer Fiberglass Laminate Damage, Class III Damage.** See figure 4, section B. Class III damage is:

a. Dents, cuts, scratches, pits, erosion or abrasions.

(1) Depth is not more than 0.02 inch in zone 1.

(2) Depth is not more than 0.029 inch in zones II and III.

(3) Diameter is not more than 2.62 inches.

(4) Distance between damages is not less than one diameter edge to edge.

(5) Depth of damage does not include surface finish or sealing materials.

13. **Outer Fiberglass Laminate Damage, Unbonds, and Delaminations, Class IV Damage.** See figure 4, section C. Class IV damage is:

a. Dents, cuts, scratches, pits, erosion or abrasions.

(1) Depth is not more than 0.02 inch in zone I.

(2) Depth is not more than 0.029 inch in zones II and III.

(3) Diameter is not more than 5 inches in zone I.

(4) Diameter is not more than 8 inches in zone II.

(5) Diameter is not more than 12 inches in zone III.

(6) Distance between damages is not less than one diameter edge to edge.

(7) Depth of damage does not include surface finish or sealing materials.

(8) Distance from edge of damage to any attachment or opening is not less than 2 inches.

b. Unbonds or delaminations.

(1) Depth is not more than 0.04 inch in zone I.

(2) Depth is not more than 0.06 inch in zones II and III.

(3) Diameter is more than 1 inch, but less than or equal to 5 inches in zone I.

(4) Diameter is more than 1 inch, but less than or equal to 8 inches in zone II.

(5) Diameter is more than 1 inch, but less than or equal to 12 inches in zone III.

(6) Distance between damages is not less than one diameter edge to edge.

(7) Depth of damage does not include surface finish or sealing materials.

(8) Distance from edge of damage to any attachment or opening is not less than 2 inches.

14. Outer Skin and Honeycomb Core Damage, Class V Damage. See figure 4, section D. Class V damage is:

a. Cuts, scratches, pits, erosion or abrasions.

(1) Full penetration of outer skin and honeycomb core.

(2) Diameter is not more than 1 inch.

(3) No damage to inner fiberglass plies.

(4) Distance between damages is not less than one diameter edge to edge.

(5) No more than three class V repairs per tank.

(6) Distance from edge of damage to any attachment or opening is not less than 2 inches.

15. Dents With Crushed Honeycomb Core, Class VI Damage. See figure 4, section E. Class VI damage is:

a. Dents.

(1) Depth is not more than 0.10 inch.

(2) Diameter is not more than 5 inches in zone I.

(3) Diameter is not more than 8 inches in zone II.

(4) Diameter is not more than 12 inches in zone III.

(5) Distance between damages is not less than one diameter edge to edge.

(6) Distance from edge of damage to any attachment or opening is not less than 2 inches.

16. Outer Skin, Honeycomb Core Damage and/or Dents With Crushed Core, Class VII Damage. See figure 4, section F. Class VII damage is:

a. Cuts, scratches, pits, erosion or abrasions.

(1) Full penetration of outer skin and honeycomb core.

(2) No damage to inner fiberglass plies.

(3) Diameter is not more than 5 inches in zone I.

(4) Diameter is not more than 8 inches in zone II.

(5) Diameter is not more than 12 inches in zone III.

(6) Distance between damages is not less than one diameter edge to edge.

(7) Distance from edge of damage to any attachment or opening is not less than 2 inches.

b. Dents.

(1) Depth is more than 0.10 inch.

(2) Diameter is not more than 5 inches in zone I.

(3) Diameter is not more than 8 inches in zone II.

(4) Diameter is not more than 12 inches in zone III.

(5) Distance between damages is not less than one diameter edge to edge.

(6) Distance from edge of damage to any attachment or opening is not less than 2 inches.

17. Outer Skin, Honeycomb Core, Inner Fiberglass Ply Damage and Delaminations Unbonds, and/or Class VIII Damage. See figure 4, section G. Class VIII damage is:

a. Full penetration of outer skin, honeycomb core, and inner fiberglass plies.

(1) No damage to aluminum shell.

(2) Diameter is not more than 5 inches in zone I.

(3) Diameter is not more than 8 inches in zone II.

(4) Diameter is not more than 12 inches in zone III.

(5) Distance between damages is not less than one diameter edge to edge.

(6) Distance from edge of damage to any attachment or opening is not less than 2 inches.

b. Unbonds and/or delaminations.

(1) Depth is more than 0.30 inch.

(2) Diameter is more than 1 inch, but less than or equal to 5 inches in zone I.

(3) Diameter is more than 1 inch, but less than or equal to 8 inches in zone II.

(4) Diameter is more than 1 inch, but less than or equal to 12 inches in zone III.

(5) Distance between damages is not less than one diameter edge to edge.

(6) Distance from edge of damage to any attachment or opening is not less than 2 inches.

18. Edge Delamination, Edge Damage and Damage at Fastener Holes in Solid Laminate, Class IX Damage. See figure 4, section H. Class IX damage is:

a. Edge damage.

(1) There must be at least two fastener diameters clearance between a fastener hole and edge of damage.

(2) Damage must be removed in a stepped configuration. The damage may not extend more than 0.20 inch from the edge, this includes the shallow step of 0.007 inch minimum.

b. Fastener hole damage.

(1) Delaminations, may be open to honeycomb core.

(2) Unbonds, may be open to honeycomb core.

c. Edge Delamination.

(1) Length of damage is unlimited.

(2) Distance from edge will not exceed 2 inches.

19. Corrosion of Aluminum Skin, Class X Damage. Class X damage is corrosion that does not exceed the limits listed in paragraph 4, step g.

20. Water in Honeycomb Core, Class XI Damage. Class XI damage is water trapped in honeycomb core.

21. REPAIRS.

- a. Repair classes I thru VII (WP024 01).
- b. Repair classes VIII thru X (WP024 02).
- c. Repair class XI, Water Removal (A1-F18AC-SRM-250, WP005 00).
- d. Dry damaged area before repairing, Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).

e. Repair rain erosion coating on forward 20 inches of tank, finish system (A1-F18AC-SRM-500, WP047 00).

22. REPLACEMENTS.

a. Cover (Door 505) is interchangeable. Fastener attaching hardware is shown on figure 5.

b. Cover (Door 506) is interchangeable. Fastener attaching hardware is shown on figure 6.

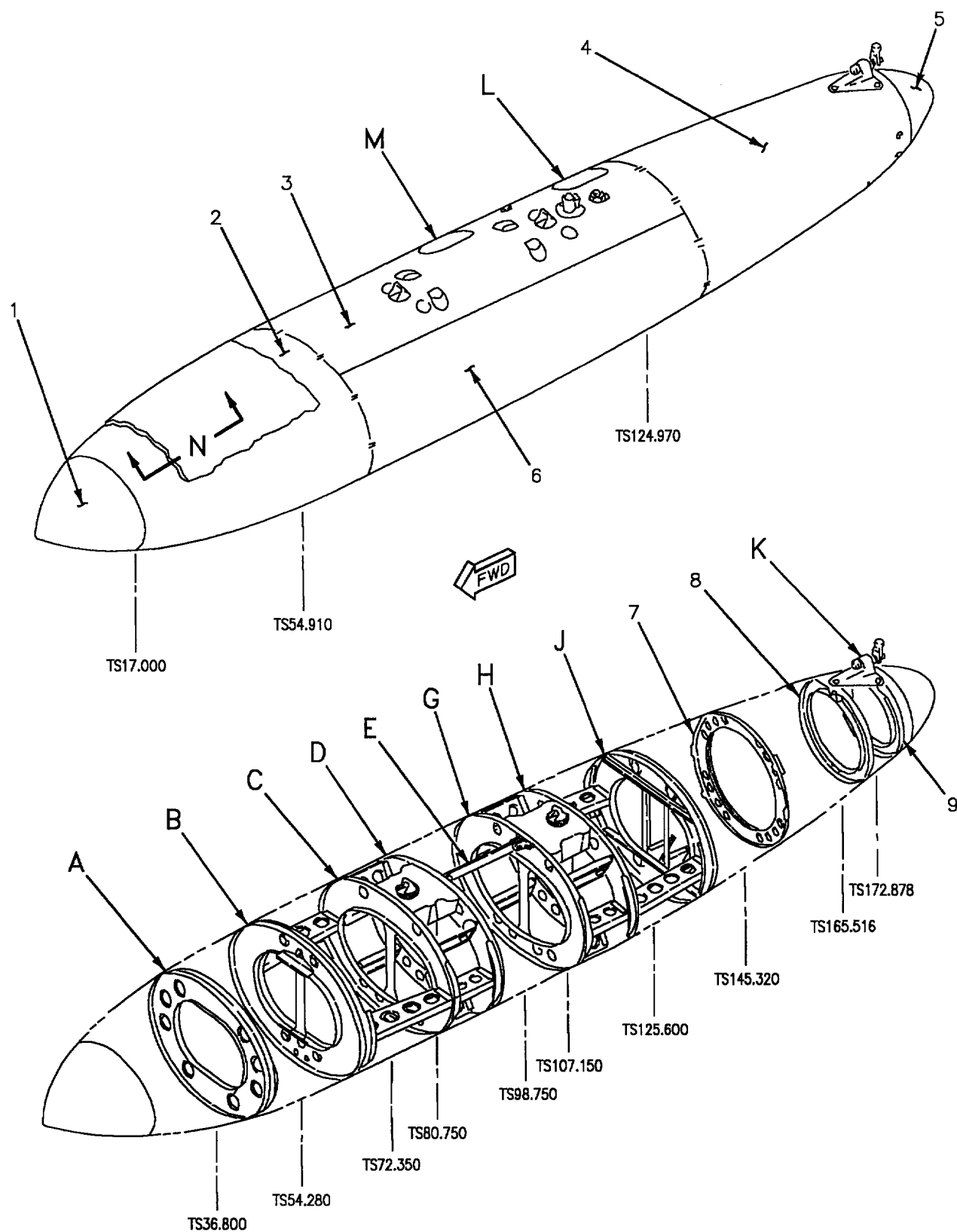


Figure 1. Material Index (Sheet 1)

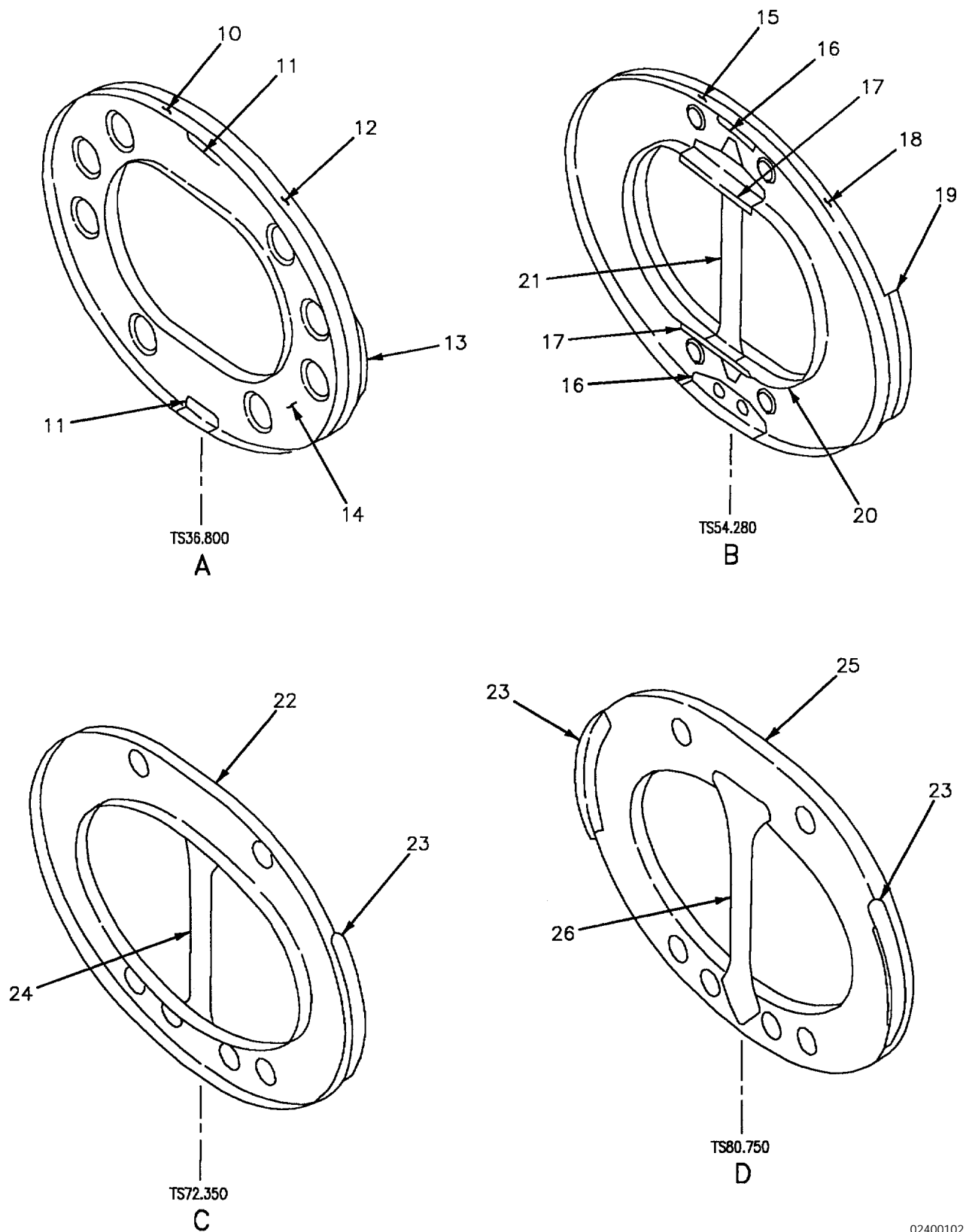


Figure 1. Material Index (Sheet 2)

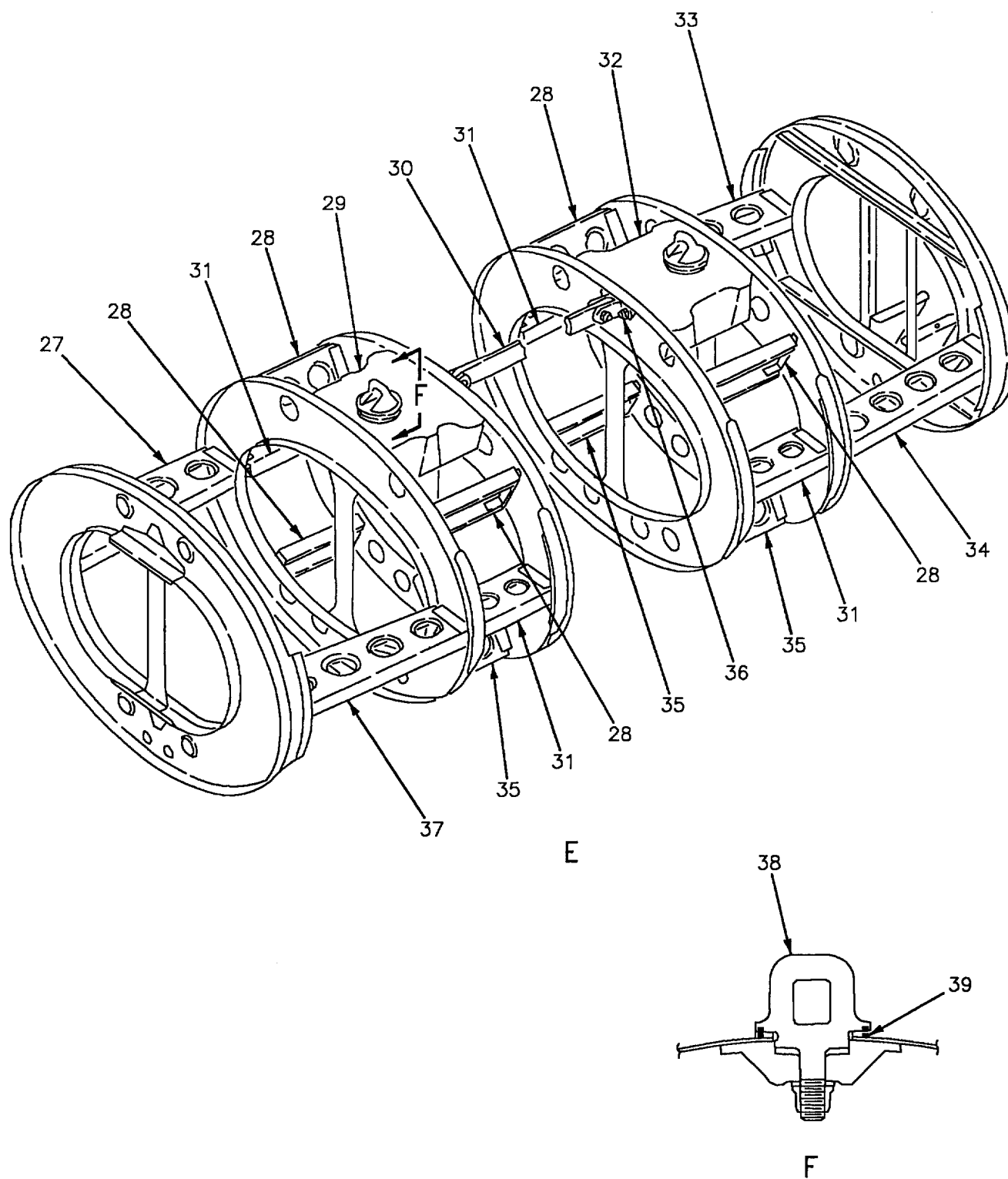


Figure 1. Material Index (Sheet 3)

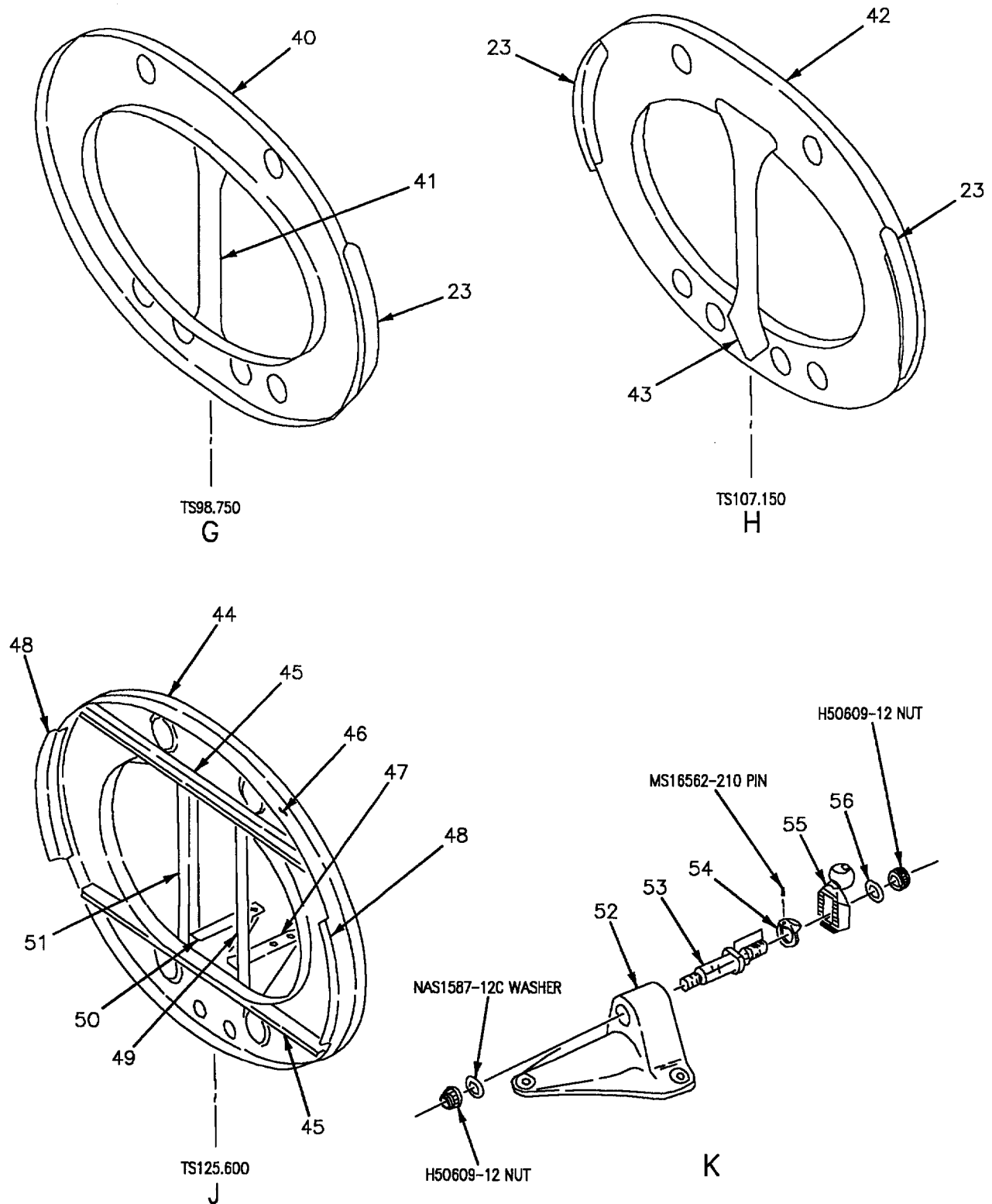


Figure 1. Material Index (Sheet 4)

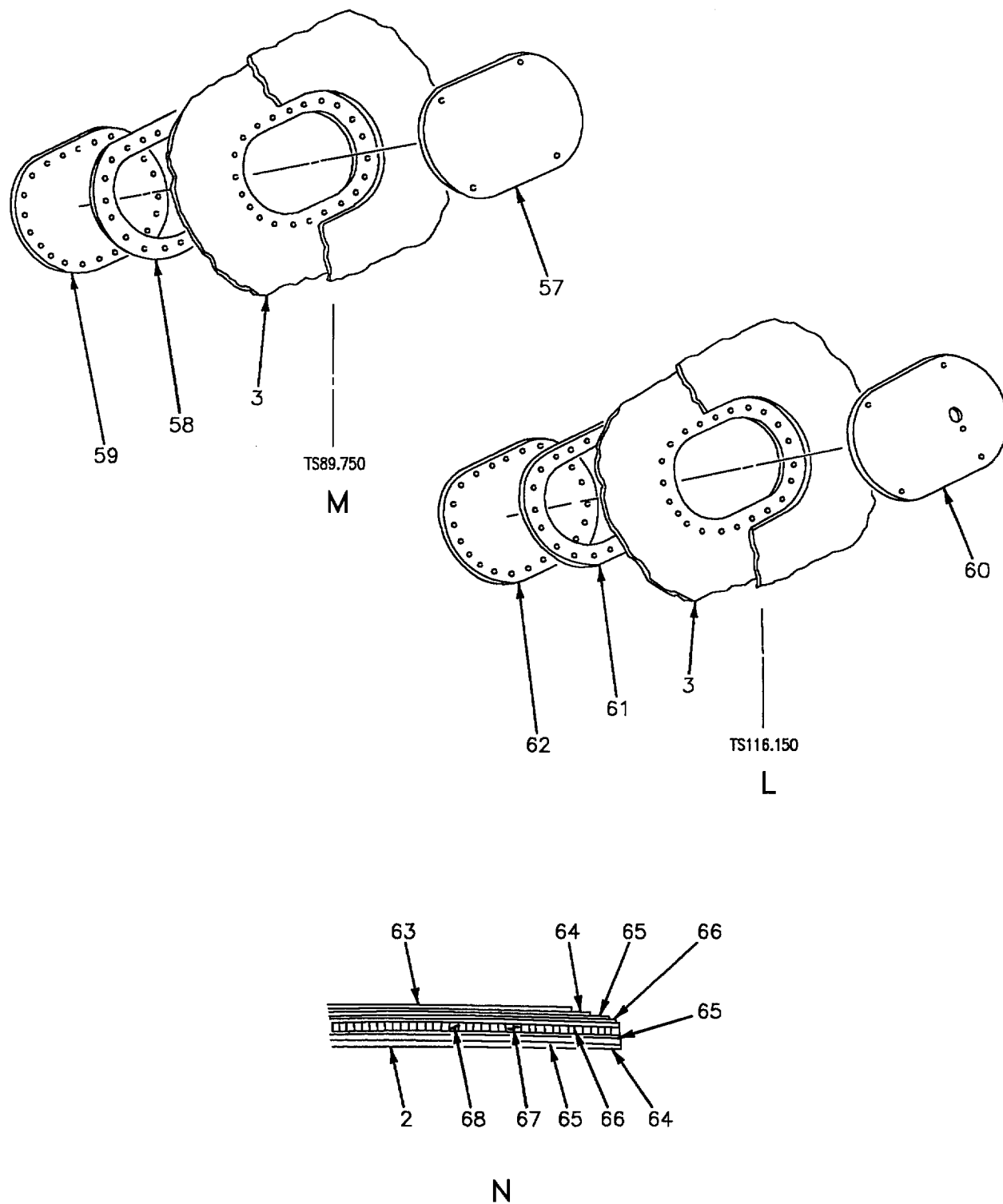


Figure 1. Material Index (Sheet 5)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
1		Skin 74A550685-2001	0.071 Sheet	6061-T62 Al Aly
2		Skin 74A550685-2013	0.071 Sheet	6061-T62 Al Aly
3		Skin 74A550688-2011	0.071 Sheet	6061-T4 Al Aly
4		Skin 74A550687-2013, -2014	0.071 Sheet	6061-T62 Al Aly
5		Skin 74A550687-2001, -2002	0.071 Sheet	6061-T62 Al Aly
6		Skin 74A550689-2011	0.071 Sheet	6061-T4 Al Aly
7		Frame 74A550681-2001, -2002	Machining	6061-T62 Al Aly
8		Frame 74A550680-2003	Machining	6061-T62 Al Aly
9		Frame 74A550679-2003, -2004	Machining	6061-T62 Al Aly
10		Cap 74A550684-2021	0.063 Sheet	7075-T62 Al Aly
11		Doubler 74A550684-2023	0.063 Sheet	7075-T62 Al Aly
12		Cap 74A550684-2022	0.063 Sheet	7075-T62 Al Aly
13		Clip 74A550684-2017	0.071 Sheet	6061-T6 Al Aly
14		Ring 74A550684-2019	0.063 Sheet	7075-T6 Al Aly
15		Cap 74A550683-2022	0.063 Sheet	7075-T6 Al Aly
16		Splice 74A550683-2029	0.063 Sheet	7075-T6 Al Aly
17		Splice 74A550683-2025	0.063 Sheet	7075-T6 Al Aly
18		Cap 74A550683-2021	0.063 Sheet	7075-T6 Al Aly

Figure 1. Material Index (Sheet 6)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
19		Doubler 74A550683-2005	0.063 Sheet	7075-T6 Al Aly
20		Ring 74A550683-2019	0.063 Sheet	7075-T6 Al Aly
21		Strap 74A550683-2023	0.250 Plate	7075-T7651 Al Aly
22		Frame 74A550745-2001	0.125 Sheet	7075-T76 Al Aly
23		Tee 74A550745-2017	1MA160C01	6061-T6 Al Aly
24		Strap 74A550745-2009	0.250 Plate	7075-T765 Al Aly
25		Frame 74A550745-2003	0.125 Sheet	7075-T76 Al Aly
26		Strap 74A550745-2011	0.250 Plate	7075-T76 Al Aly
27		Stabilizer 74A550746-2001	0.071 Sheet	2024-T72 Al Aly
28		Stabilizer 74A550746-2007	0.071 Sheet	2024-T72 Al Aly
29		Support 74A550747-2003	Machining	7075-T73 Al Aly
30		Link 74A550749-2001	0.050 Sheet	7075-T7351 Al Aly
31		Stabilizer 74A550746-2003	0.071 Sheet	2024-T72 Al Aly
32		Support 74A550747-2001	Machining	7075-T73 Al Aly
33		Stabilizer 74A550746-2010	0.071 Sheet	2024-T72 Al Aly
34		Stabilizer 74A550746-2009	0.071 Sheet	2024-T72 Al Aly
35		Stabilizer 74A550746-2005	0.071 Sheet	2024-T72 Al Aly
36		Clevis 74A550748-2001	0.175 Sheet	7075-T7351 Al Aly

Figure 1. Material Index (Sheet 7)

Idx No.	Eft	Nomenclature and Part No.	Description	Material
37		Stabilizer 74A550746-2002	0.071 Sheet	2024-T72 Al Aly
38		Lug 74A550699-2003	0.362 Plate	PH13-8M0 Cres
39		Spacer 74A550700-2003	0.312 Plate	2024-T351 Al Aly
40		Frame 74A550745-2005	0.125 Sheet	7075-T76 Al Aly
41		Strap 74A550745-2013	0.250 Plate	7075-T7651 Al Aly
42		Frame 74A550745-2007	0.125 Sheet	7075-T76 Al Aly
43		Strap 74A550745-2015	0.250 Plate	7075-T7651 Al Aly
44		Ring 74A550682-2023	0.063 Sheet	7075-T6 Al Aly
45		Stiffener 74A550682-2029	0.070 Sheet	7075-T6 Al Aly
46		Doubler 74A550682-2025	0.063 Sheet	7075-T6 Al Aly
47		Bracket 74A550682-2016	0.063 Sheet	7075-T6 Al Aly
48		Clip 74A550682-2003	0.063 Sheet	6061-T62 Al Aly
49		Angle 74A550682-2028	Machining	1MA100D03-10031
50		Bracket 74A550682-2015	0.063 Sheet	7075-T6 Al Aly
51		Angle 74A550682-2027	Machining	1MA100D03-10031
52		Support 74A550674-2009	Machining	7075-T73 Al Aly
53		Shaft 74A550677-2003	Machining	PH13-8M0 Cres
54		Plate 74A550676-2003	Machining	PH13-8M0 Cres

Figure 1. Material Index (Sheet 8)











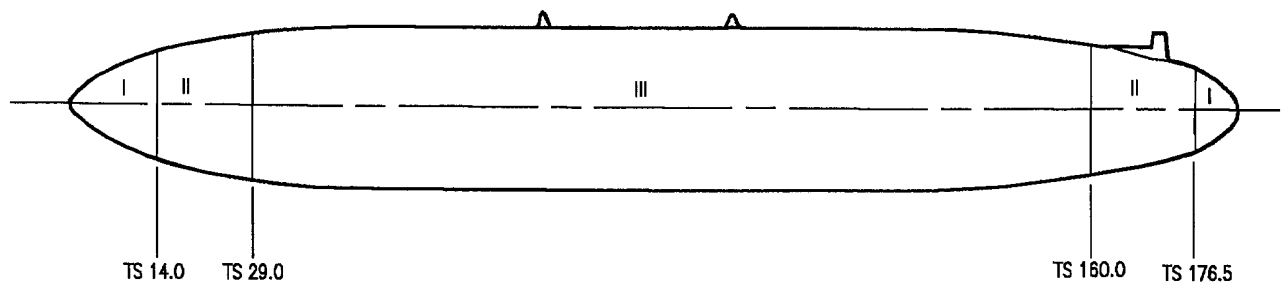
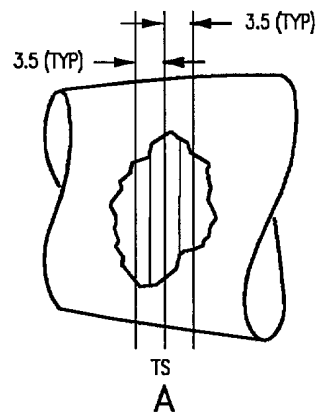
Idx No.	Eft	Nomenclature and Part No.	Description	Material
55		Adapter 74A550672-2003	0.175 Sheet	PH13-8MO CRES
56		Washer 74A550691-2001	Machining	4340 CRES
57		Cover (Door 505) 74A550705-1005	Sheet	
58		Gasket 74A550704-2003	0.063 Sheet	
59		Cover (Door 505) 74A550703-2007	0.071 Sheet	7075-T6 Alclad
60		Cover (Door 506) 74A550705-1003	Sheet	
61		Gasket 74A550704-2005	0.063 Sheet	
62		Cover (Door 506) 74A550695-2011	0.071 Sheet	7075-T6 Alclad
63		Cloth 74A550695-2011	Roll	Carbon Fabric
64		Cloth 74A550695-2013	Roll	Woven Glass
65		Roving 74A550695-2005	Filament	Fibrous Glass
66		Roving 74A550695-2007	Filament	Graphite Fibers
67		Filler 74A550695-2003	Sheet	Urethane
68		Core 74A550695-2001		
<p style="text-align: center;">LEGEND</p> <p> Fiberglass reinforced plastic.</p> <p> Cork and rubber composition.</p> <p> Over-expanded core honeycomb.</p> <p> Nylon fiber paper base.</p>				

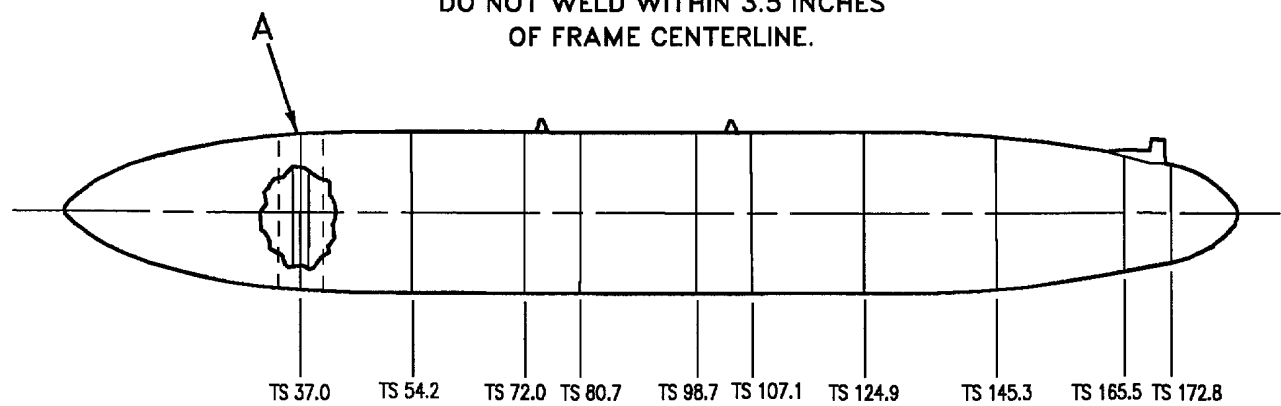
Figure 1. Material Index (Sheet 9)



ZONING



TYPICAL EACH TANK STATION
DO NOT WELD WITHIN 3.5 INCHES
OF FRAME CENTERLINE.



METAL SKIN AND SURVIVABILITY WRAP

Figure 2. Repair Zones (Sheet 1)

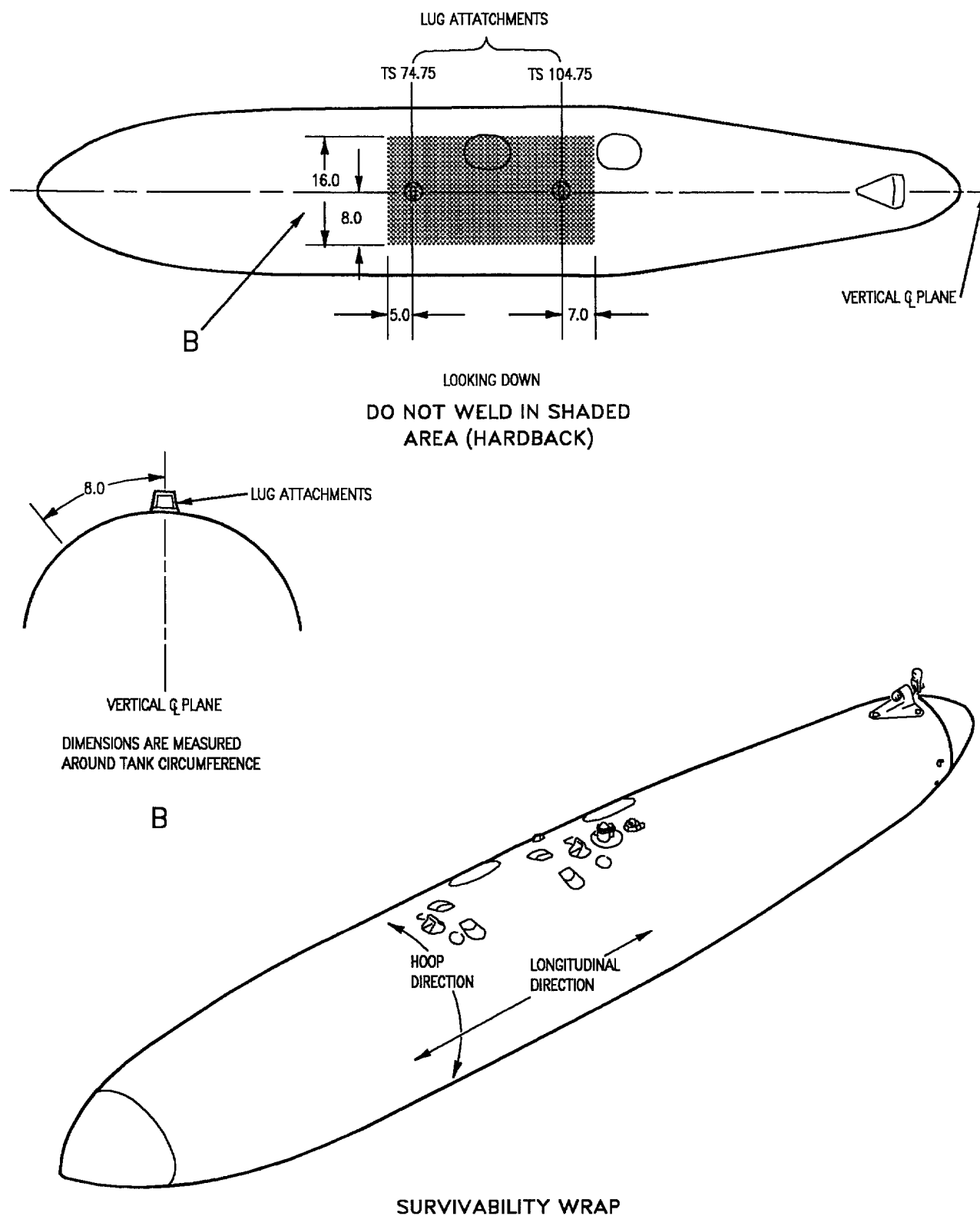


Figure 2. Repair Zones (Sheet 2)

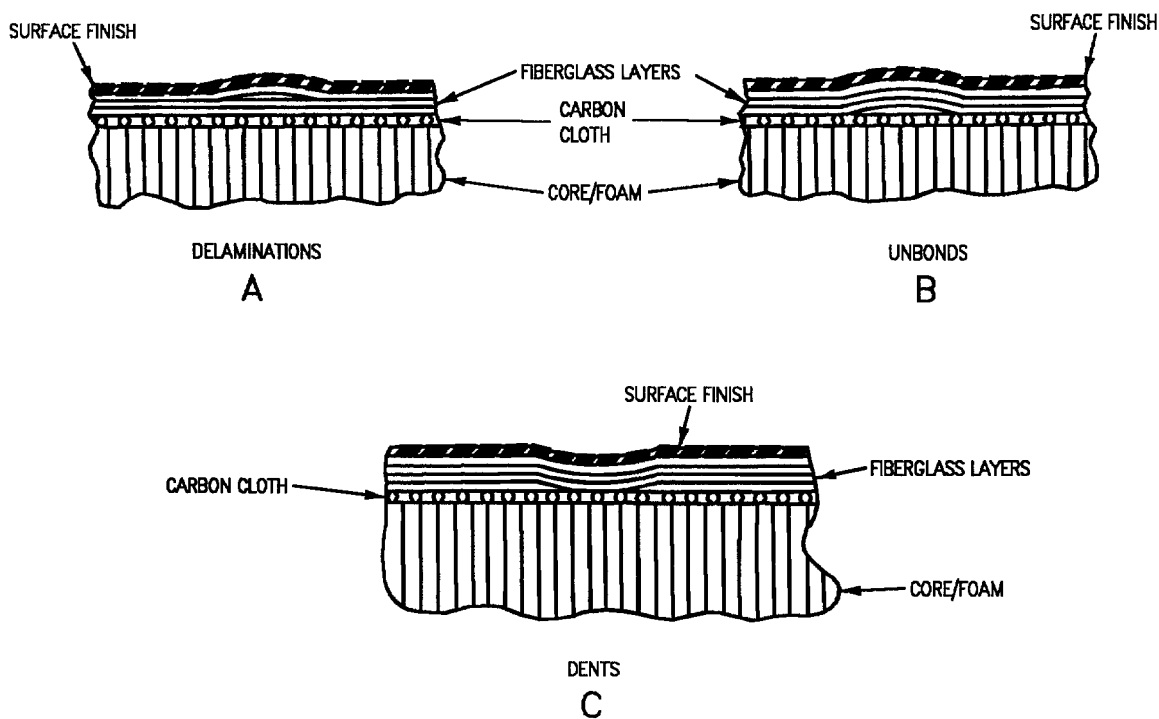
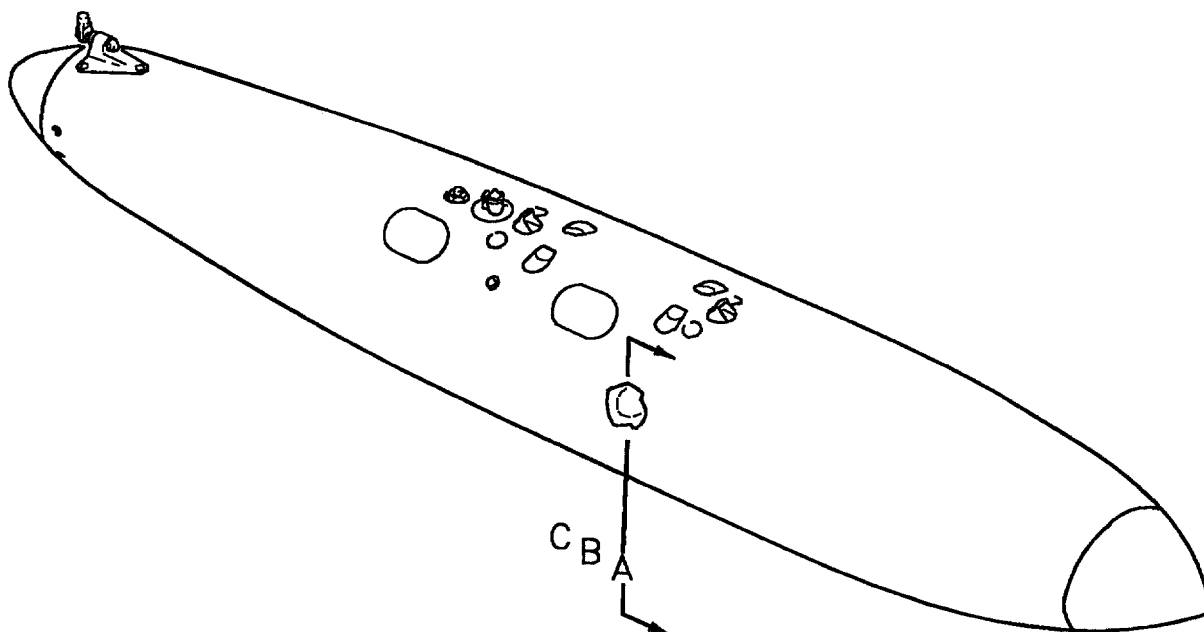


Figure 3. Negligible Damage

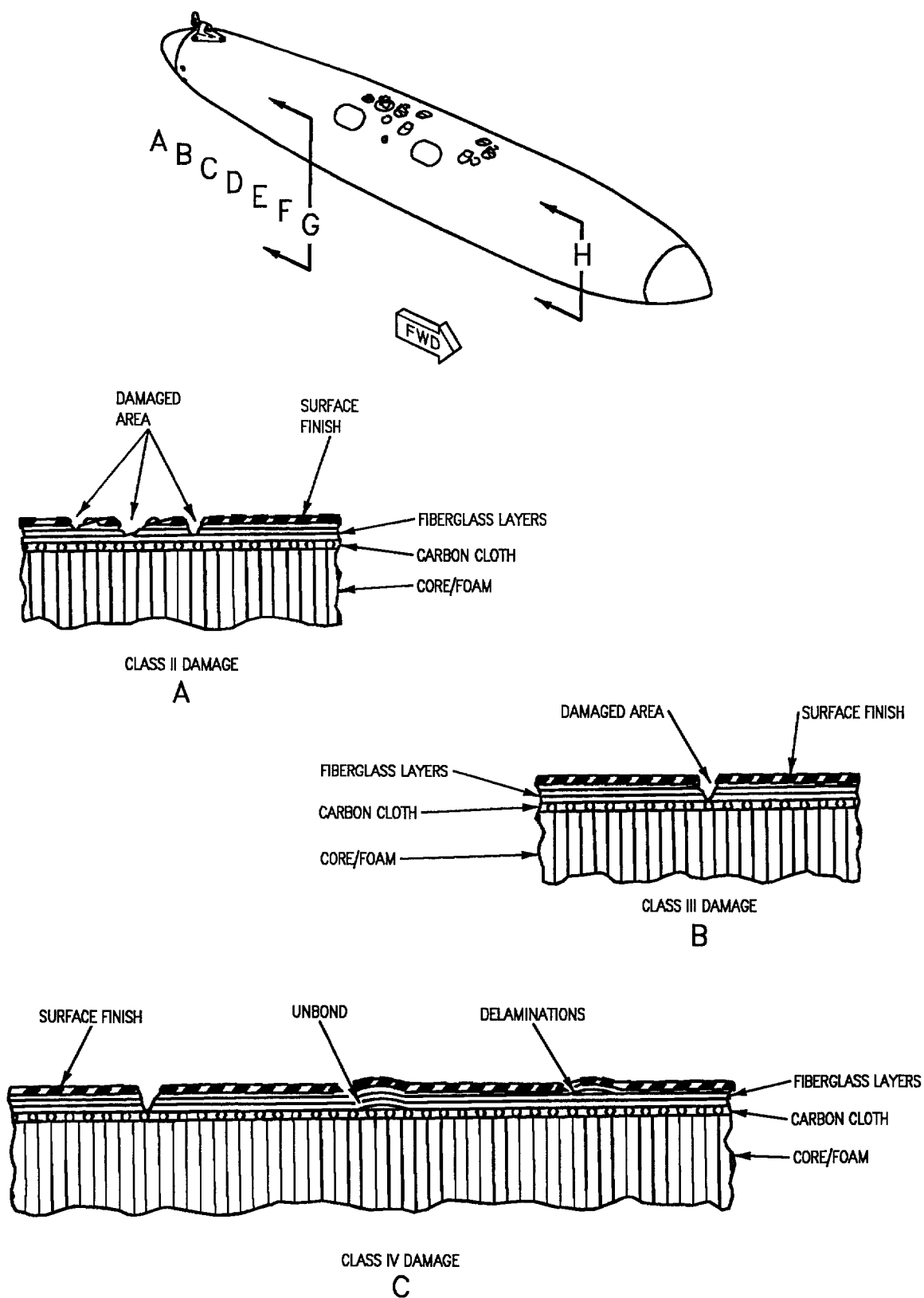


Figure 4. Repairable Damage (Sheet 1)

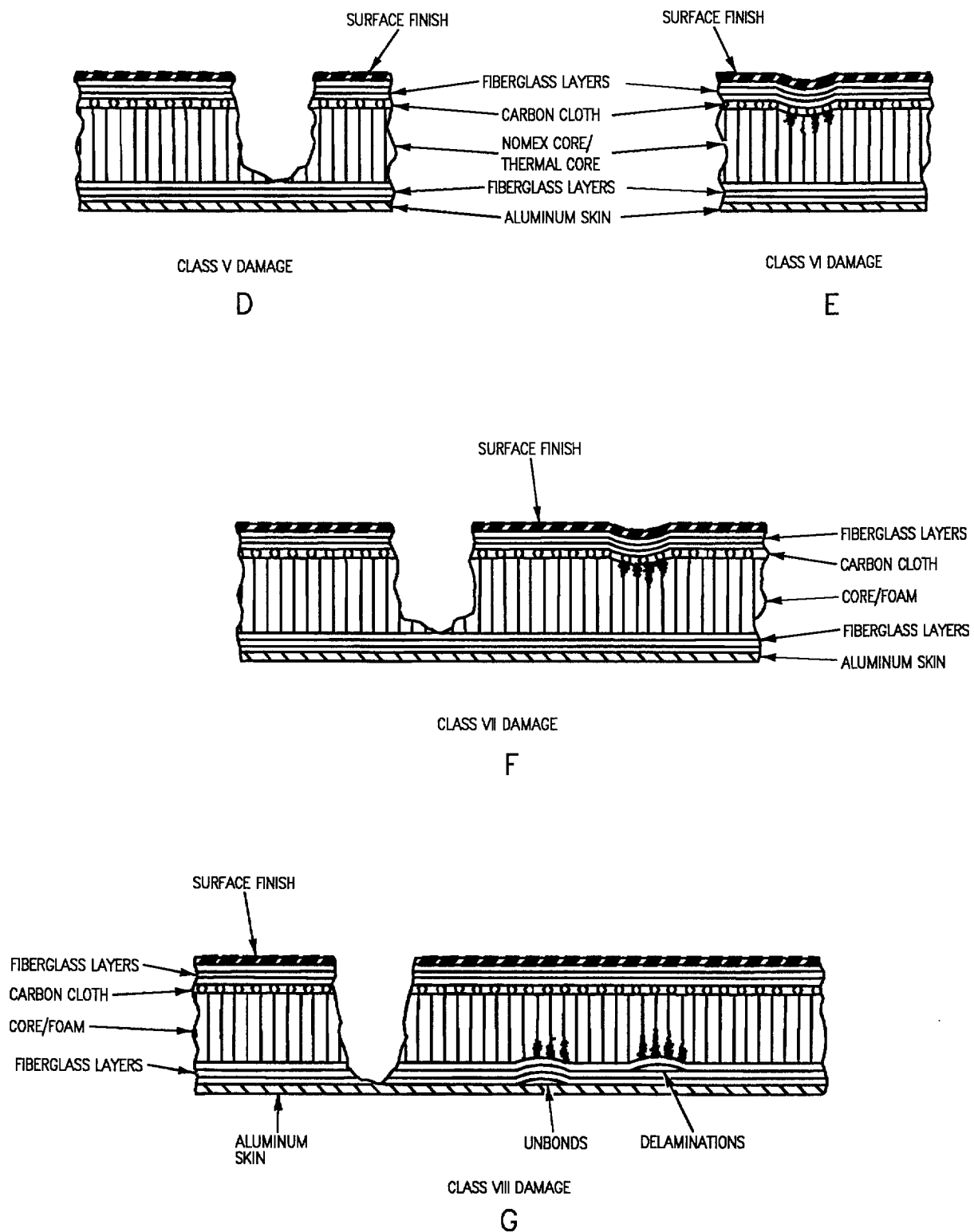


Figure 4. Repairable Damage (Sheet 2)

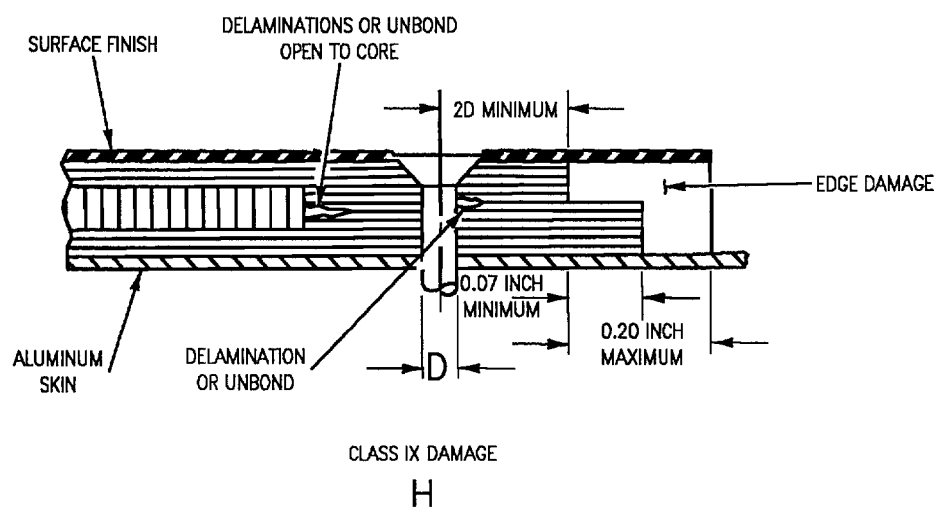


Figure 4. Repairable Damage (Sheet 3)

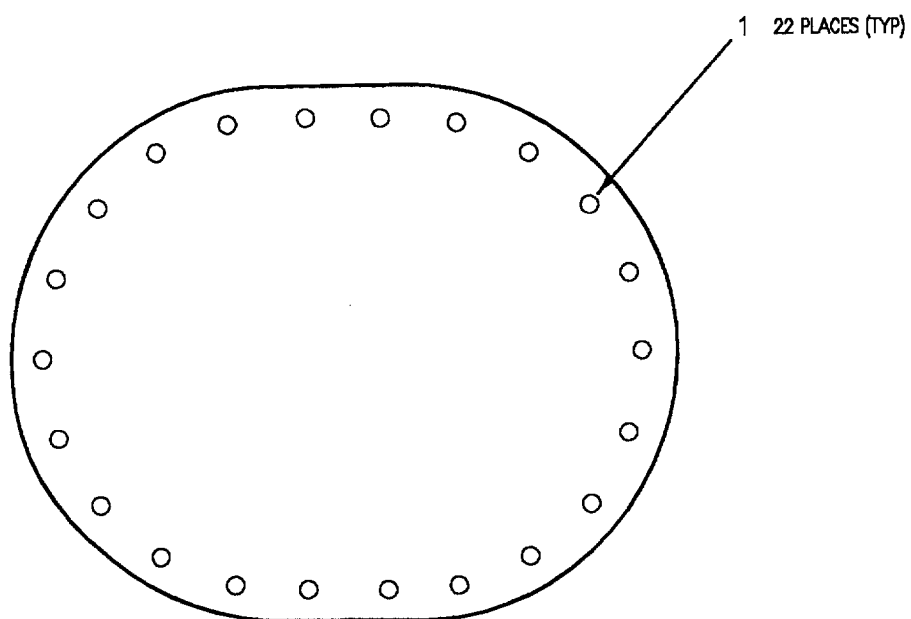


Figure 5. Cover (Door 505) Replacement (Sheet 1)



Idx No.	Eft		Nomenclature	Part Number
1			Platenut	F49249E3-1
LEGEND				
 Hole diameter is 0.191 +0.006 -0.000.				

Figure 5. Cover (Door 505) Replacement (Sheet 2)

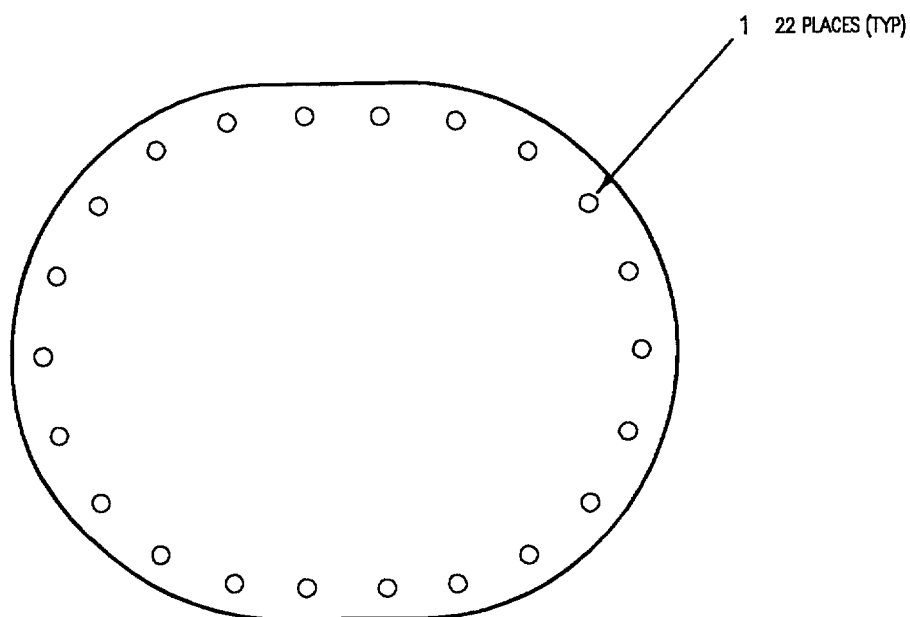


Figure 6. Cover (Door 506) Replacement (Sheet 1)



Idx No.	Eft		Nomenclature	Part Number
1			Platenut	F49249E3-1
LEGEND				
 Hole diameter is 0.191 +0.006 -0.000.				

Figure 6. Cover (Door 506) Replacement (Sheet 2)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

EXTERNAL FUEL TANK, ELLIPTICAL, PART NO. 74A550000

SURVIVABILITY WRAP CLASS I THRU VII DAMAGE REPAIR

Reference Material

Aircraft Corrosion Control	A1-F18AC-SRM-500
Elliptical External Fuel Tank, 74A550000, Finish System and Markings	WP047 00
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Structure Repair, Typical Repair	A1-F18AC-SRM-250
Curing of Repairs	WP004 00
Aluminum, Graphite Epoxy, or Titanium Patch Installation and Removal	WP007 00

Alphabetical Index

Subject	Page No.
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Class V Damage Repair	10
Class VI Damage Repair	13
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Damage Diameter vs Core Diameter, Table 1	17

Record of Applicable Technical Directives

None

1. CLASS I DAMAGE REPAIR.

Materials Required

2. This procedure applies to damage into or throughout the surface finish.

Nomenclature

Specification
or Part Number

Support Equipment Required

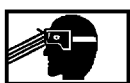
None

Isopropyl Alcohol
Paper, Abrasive
Rymple Cloth

TT-I-735, Grade 1
A-A-1047, Grit 240
AMS-3819



Isopropyl Alcohol



4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

- a. Wipe damaged area with clean rymple cloth dampened with isopropyl alcohol.
- b. Lightly sand the damaged area using abrasive paper.
- c. Wipe area with clean dry rymple cloth.
- d. Replace finish (A1-F18AC-SRM-500, WP047 00).

3. CLASS II DAMAGE REPAIR. See figure 1.

4. This procedure is applicable to damage into or through the surface ply.

Support Equipment Required

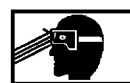
None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Brush, Varnish	H-B-695 Type 1, Grade A, Size 1 1/2
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Plastic Sheet	Grit 240
Rymple Cloth	200SG40TR
Scraper, Sealant, 45°	AMS-3819
Cutting Edge, Phenolic (Micarta or Formica)	-
Tape, Pressure Sensitive	855-1.000



Isopropyl Alcohol



4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

- a. Mask surface around damage area with tape.
- b. Clean unmasked area using clean rymple cloth moistened with isopropyl alcohol.
- c. Clean out damaged area using a sealant scraper, X-acto knife, and/or 180 grit abrasive paper.
- d. Make sure all damaged material has been removed by wiping area with clean dry rymple cloth.
- e. Rough sand damaged surfaces with 180 grit abrasive paper.
- f. Wipe dry with clean dry rymple cloth.



Adhesive

19

- g. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

- h. Apply one or more coats of adhesive to fill in and level the surface.

- i. Cover with tedlar film and work out any trapped air using a roller or squeegee.

j. Cure adhesive (A1-F18AC-SRM-250, WP004 00).

k. After cure, lightly sand damaged area with 240 grit abrasive paper.

l. Wipe area with clean dry rymple cloth.

m. Replace finish (A1-F18AC-SRM-500, WP047 00).

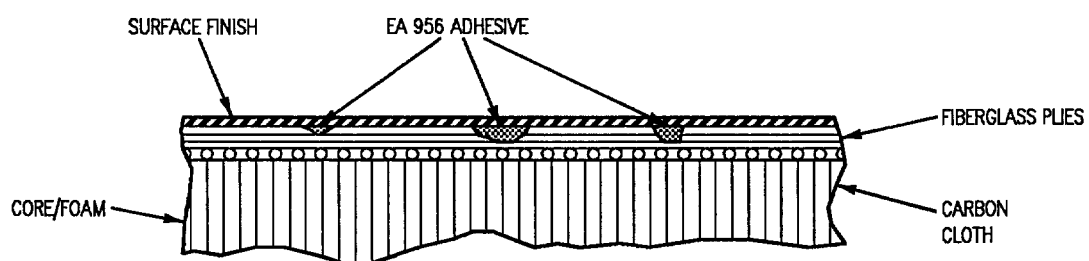


Figure 1. Class II Damage Repair

5. **CLASS III DAMAGE REPAIR.** See figure 2.

6. This repair procedure applies to small area damage to surface plies down to the carbon cloth layer.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Brush, Varnish	H-B-695 Type 1, Grade A, Size 1 1/2
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180 Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Scraper, Sealant, 45° Cutting Edge, Phenolic (Micarta or Formica)	-
Tape, Pressure Sensitive	855-1.000

a. Mask surface around damage area with tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Clean unmasked area using clean rymple cloth moistened with isopropyl alcohol.



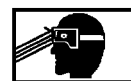
Do not damage carbon cloth layer. Limit depth of router, step c, or drill step e, to prevent damage to carbon cloth.

c. Clean out damaged area using a router bit, X-acto knife, sealant scraper, and/or 180 grit abrasive paper.

d. Make sure all damaged material has been removed by wiping area with clean dry rymple cloth.

e. If damage is a crack with sharp edges, stop drill through the outer fiberglass plies, at each end of the crack. Taper damaged area to get a slope of about 45 to 60 degrees using a No. 40 drill bit.

f. Wipe clean with clean, dry rymple cloth.



Adhesive

19

g. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

h. Apply coats of adhesive to fill in and level the surface.

i. Cover with tedlar film and work out any trapped air and excess resin using a roller or squeegee.

j. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

k. After cure, lightly sand damaged area with 240 grit abrasive paper.

l. Wipe area with clean dry rymple cloth.

m. Replace finish (A1-F18AC-SRM-500, WP047 00).

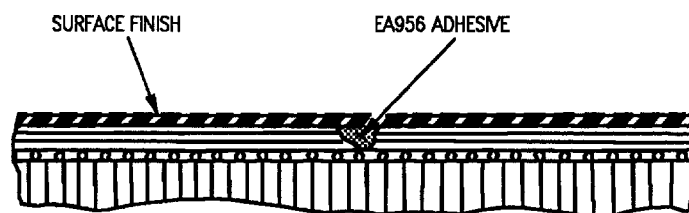
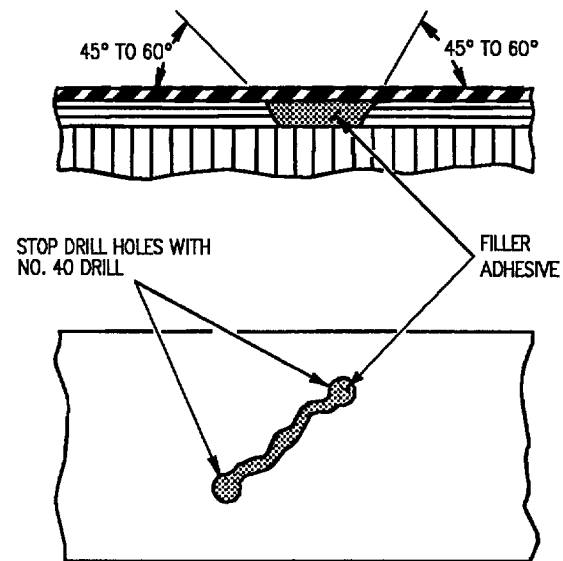


Figure 2. Class III Damage Repair

7. **CLASS IV DAMAGE REPAIR.** See figure 3.

8. This repair applies to large area damage to surface plies down to the carbon cloth layer.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Brush, Varnish	H-B-695 Type 1, Grade A, Size 1 1/2
Cloth, Satin	MIL-C-9084, Type 8, Class 2
Cloth, Teflon	TEMP-R-GLAS 3TLL
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180 Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

a. Mask surface around damage area with tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

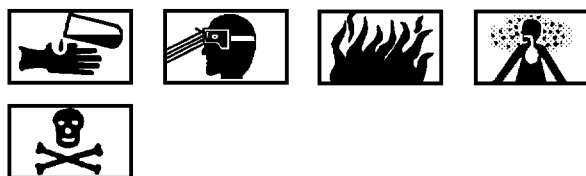
b. Clean unmasked area using clean rymple cloth moistened with isopropyl alcohol.



Do not route or sand into the carbon layer beneath the damaged laminate layers to avoid possible damage underneath.

c. Clean out damaged area using a router with controlled cutting depth. Sand smooth with 180 grit abrasive paper.

d. Wipe with clean dry rymple cloth.



Adhesive

19

e. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

f. Saturate a large piece of glass fabric breather cloth with adhesive.

g. Put tedlar film on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

h. Cut three glass fabric breather cloth layers saturated with adhesive to exact fit.

i. Place the saturated glass fabric breather cloth in repair area.

j. Cover this layup with one layer of porous release fabric, teflon coated.

k. Cure repair (A1-F18AC-SRM-250, WP004 00).

l. After cure, sand smooth and flush with surface with 180 grit abrasive paper. Remove all traces of finish within 2.5 inches of repair hole.

m. Wipe with clean dry rymple cloth.

n. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

o. Saturate a large piece of glass fabric breather cloth with adhesive.

p. Put tedlar film on both sides of glass fabric and work out air bubbles using a roller or squeegee.

q. Cut three plies of saturated glass fabric breather cloth to the size indicated. The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply by a minimum of 0.12 inch (0.25 inch small in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

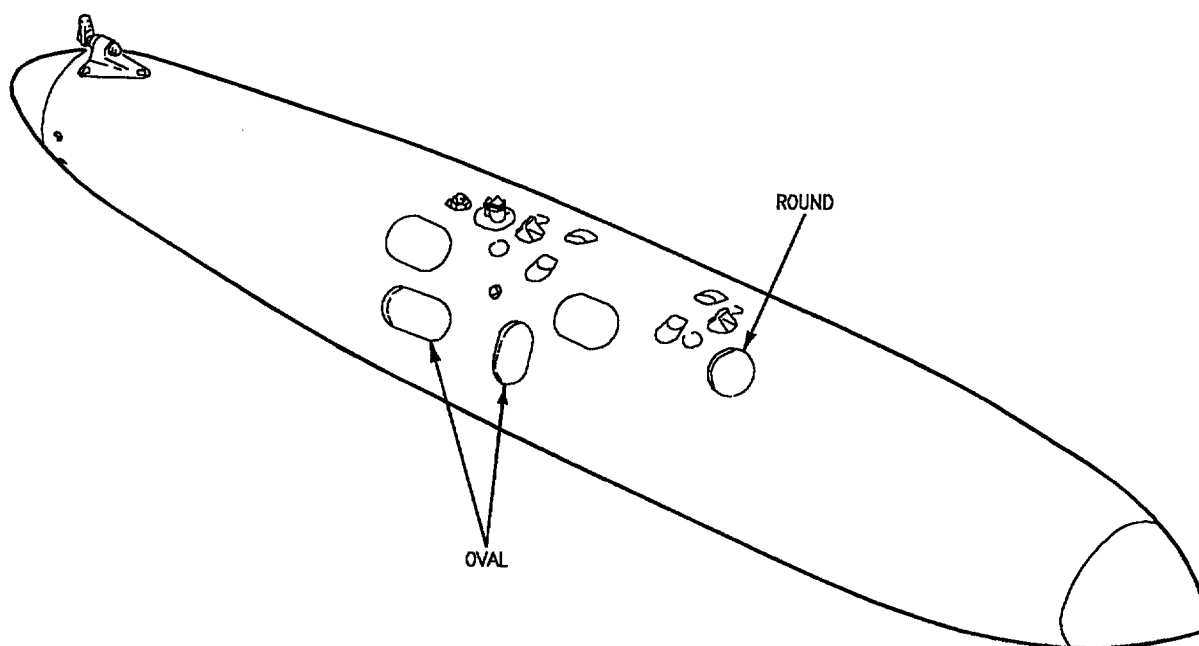
r. Paint repair surface with a thin layer of adhesive. Overlay repair with the three layers of glass fabric breather cloth with adhesive.

s. Cure repair (A1-F18AC-SRM-250, WP004 00).

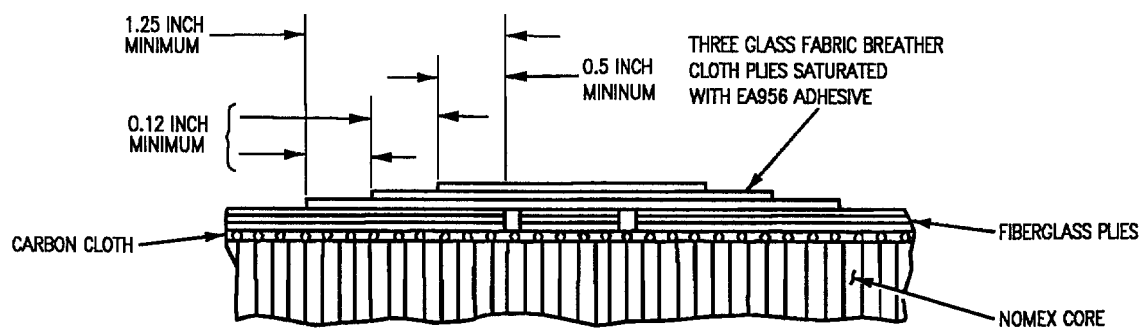
t. After cure, remove the tedlar film and sand the stepped edges of the glass fabric patches to a smooth contour with 240 grit abrasive paper.

u. Wipe area with clean, dry rymple cloth.

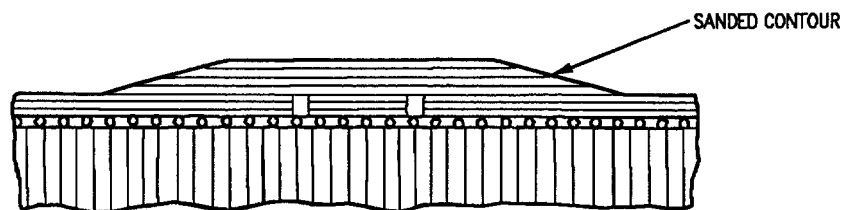
v. Replace finish (A1-F18AC-SRM-500, WP047 00).



REMOVAL OF DAMAGED LAMINATE



LAY UP OF REPAIR



FINISHED REPAIR

Figure 3. Class IV Damage Repair

9. **CLASS V DAMAGE REPAIR.** See figure 4.

10. This repair describes procedures for replacing damaged core with EA9321A/B adhesive and bonding repair with three plies of glass fabric, breather cloth saturated with EA956 adhesive.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA9321A/B
Adhesive	EA956
Cloth, Satin	MIL-C-9084, Type 8, Class 2
Cloth, Teflon	TEMP-R-GLAS 3TLL
Gloves, Chemical	ZZ-G-381, Type 1, Style 1
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180 Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

NOTE

No more than three Class V Damage Repairs are allowed per tank.

a. Mask surface around damaged area with tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth moistened with isopropyl alcohol.

c. Cut out the damaged outer skin only. Remove only enough material to remove sharp edges or corners.

d. Vacuum clean repair area.

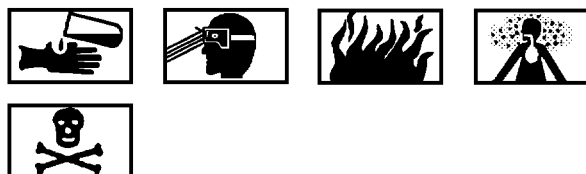


To prevent more damage, avoid sanding into base material when removing finish.

e. Complete surface preparation using 180 grit abrasive paper.

f. Vacuum sanding dust from repair area. Wipe surface clean with dry rymple cloth.

g. Dry repair area, Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).



Adhesive

2

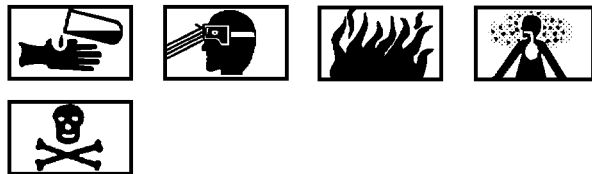
h. Prepare EA9321A/B adhesive (A1-F18AC-SRM-200, WP011 00).

i. Fill void with adhesive using a spatula. Work thoroughly into void air pockets. Trowel level with the surface. Add excess EA9321A/B adhesive to allow for shrinkage.

j. Position one ply of porous release fabric, teflon coated, over repair area.

k. Cure EA9321A/B adhesive (A1-F18AC-SRM-250, WP004 00).

l. Sand repair flush with tank surface.



Adhesive

19

m. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

n. Saturate a large piece of glass fabric breather cloth with EA956 adhesive.

o. Put tedlar film on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

NOTE

The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply by a minimum of 0.12 inch (.25 inch smaller in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

p. Cut three plies of saturated glass fabric breather cloth to the size required.

q. Paint repair surface with a thin layer of EA956 adhesive. Overlay the repair with the three layers of glass fabric breather cloth saturated with EA956 adhesive.

r. Cover layup with one layer of porous release fabric, teflon coated.

s. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

t. After cure, remove the tedlar film and sand the stepped edges of glass fabric patches to a smooth contour with 240 grit abrasive paper.

u. Wipe area with clean, dry rymple cloth.

v. Replace finish (A1-F18AC-SRM-500, WP047 00).

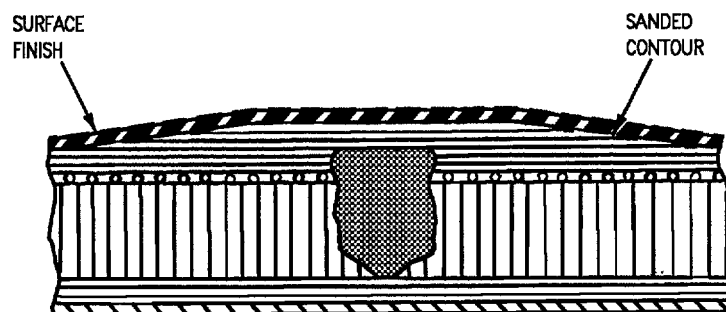
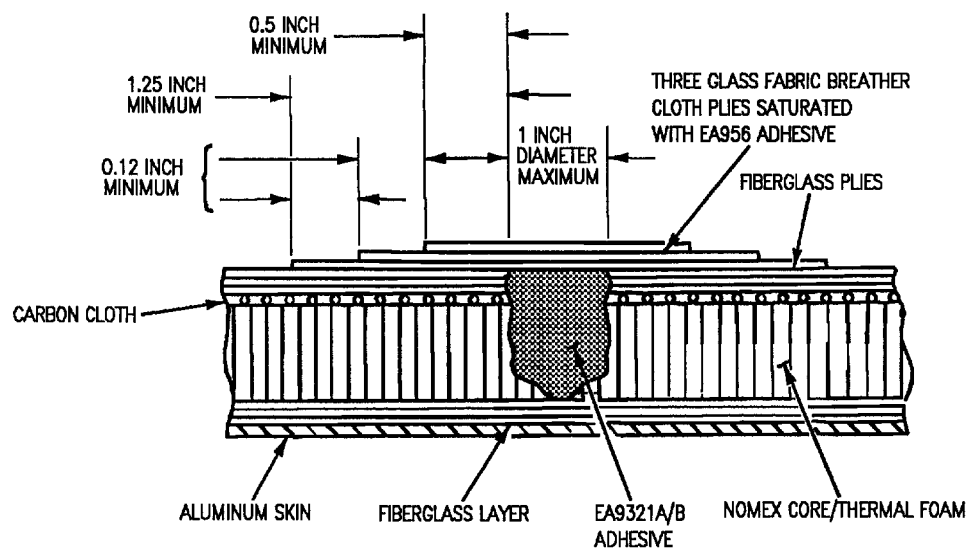


Figure 4. Class V Damage Repair

11. **CLASS VI DAMAGE REPAIR.** See figure 5.

12. This repair describes procedures for dent repair with EA9321A/B adhesive, fill and patch repair of glass fabric breather cloth saturated with EA956 adhesive.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA9321A/B
Adhesive	EA956
Cloth, Satin	MIL-C-9084, Type 8, Class 2
Gloves, Chemical	ZZ-G-381, Type 1, Style 1
Cloth, Teflon	TEMP-R-GLAS 3TLL
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
	Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Spatula, Metal	GG-D-223
Tape, Pressure Sensitive	855-1.000

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



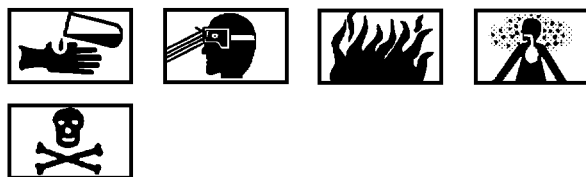
To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth moistened with isopropyl alcohol.

c. Complete surface preparation with 180 grit abrasive paper.

d. Wipe surface clean with clean, dry rymple cloth.

e. Prepare EA9321A/B adhesive (A1-F18AC-SRM-200, WP011 00).



Adhesive

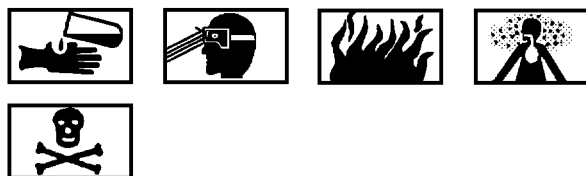
2

f. Fill dented area with EA9321A/B adhesive.

g. Position one ply of porous release fabric over repair area.

h. Cure EA9321A/B adhesive (A1-F18AC-SRM-250, WP004 00).

i. Sand repair flush with surface.



Adhesive

19

j. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

k. Saturate a large piece of glass fabric breather cloth with EA956 adhesive.

l. Put tedlar film on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

m. Cut three plies of saturated glass fabric breather cloth to the size required. The bottom ply shall overlap the damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply by a minimum of 0.12 inch (0.25 inch smaller in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

n. Paint repair surface with a thin layer of EA956 adhesive. Overlay the repair with the three layers of glass fabric breather cloth saturated with EA956 adhesive.

o. Cover layup with one layer of porous release fabric, teflon coated.

p. Cure repair (A1-F18AC-SRM-250, WP004 00).

q. After cure, remove the tedlar film and sand the stepped edges of glass fabric patches to a smooth contour with 240 grit abrasive paper.

r. Wipe area with clean, dry rymple cloth.

s. Replace finish (A1-F18AC-SRM-500, WP047 00).

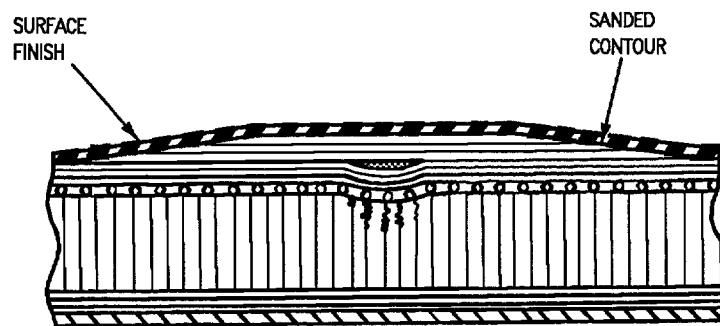
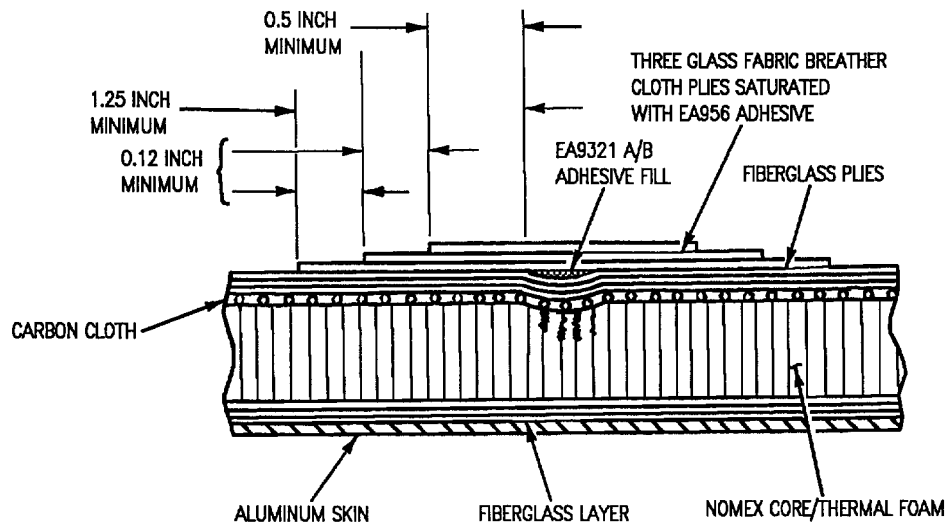


Figure 5. Class VI Damage Repair

13. **CLASS VII DAMAGE REPAIR.** See figure 6.

14. This procedure describes the replacement of core and splice of carbon cloth and glass fabric breather cloth plies.

Support Equipment Required

None

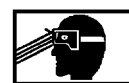
Materials Required

NOTE

Alternate item specifications or part numbers are listed in parentheses.

Nomenclature	Specification or Part Number
Adhesive	EA956
Annealed Copper	QQ-C-576, 0.020 Inch Thick
Core Material, Over- expanded Nomex Core, 0.250 Inch Thick	MMS-715, Type 3
Dry Woven Graphite Cloth, Satin Weave	MMS-544
Glass Fabric, Breather Cloth	MIL-C-9084, Type 8, Class 2
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180 Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Steel Music Wire	QQ-W-470, 0.040 Inch Thick
Tape, Pressure Sensitive	855-1.000
Thermal Insulation	Trymer CPR9501

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

c. Cut out the damaged outer skin only. Remove only enough material to remove sharp edges or corners.

d. Vacuum clean repair area.



To prevent more damage, avoid sanding into base material when removing finish.

e. Remove damaged nomex core using router, X-acto knife, and chisel.

f. Complete surface preparation using 180 grit abrasive paper.

g. Vacuum sanding dust from repair area. Wipe surface clean with dry rymple cloth.

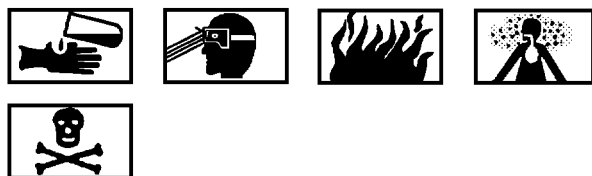
h. Dry repair area, Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).

i. Cut nomex core smaller than diameter of damage. See Table 1.

Table 1. Damage Diameter vs Core Diameter

Damage Diameter (Inches)	Subtractive Factor (Inch)
0-2	0
2-4	0.05
4-8	0.08
8-12	0.12

Core Diameter = Damage Diameter - Subtractive Factor



Adhesive

19

j. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

k. Spread a layer of adhesive over bottom repair surface and exposed core using a small brush.

l. Spread adhesive on one side and periphery of nomex core plug.

NOTE

The core should be placed so as to give the best core cell flexibility to conform to tank curvature.

m. Center overexpanded nomex core into repair area. Place core into repair with the adhesive-covered side down.

n. Cut thermal insulation to same diameter as the nomex core.

o. Insert the overexpanded nomex core with thermal insulation using a roller. Roll the insulation into the core by working from the center out to the edges.

p. Fill any peripheral voids with adhesive.

q. Position a copper sheet (add weights if necessary) over the repair to hold it in place. Cut notches in the sheet to aid in fitting the contoured tank surface.

NOTE

To facilitate notching the copper sheet to fit contour of external fuel tank, see detail

A. Position paper, or similar material, over the tank contour. Fold the material to cause it to conform to the tank surface. Use folded material as a pattern for notching the copper sheet.

r. Saturate a large layer of carbon cloth with adhesive. The carbon cloth shall be large enough to cut into two pieces, one the size of the core and another to overlap the core by a minimum 1/2-inch.

s. Put plastic sheet on both sides of unimpregnated carbon cloth and work out air bubbles using a roller or squeegee.

t. Cut carbon cloth to size of core plug (orientation not important).

u. Remove copper sheet from repair.

v. Position saturated carbon cloth over core.

NOTE

Orient the wire in the hoop direction at approximately 1 inch spacing. A minimum of one wire per inch of damage opening in the longitudinal direction is required.

w. Trap the repair with steel music wire into inserted the adjacent core a minimum of 1 inch using lock wire pliers.

x. Cut another saturated carbon cloth to overlap the core plug and original carbon cloth by a minimum of 1/2 inch.

y. Overlay the saturated carbon cloth on the repair.

z. Saturate a large piece of glass fabric breather cloth with adhesive.

aa. Put plastic sheet on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

ab. Cut two plies of saturated glass fabric breather cloth to splice into the repair.

ac. Overlay the saturated cloth plies on the repair.

ad. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

ae. Sand repair to smooth finish. Remove tank finish 2.5 inches from edge of damage.

af. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

ag. Saturate a large piece of glass fabric breather cloth with adhesive.

ah. Put plastic sheet on both sides of glass fabric breather cloth, and work out air bubbles using a roller or squeegee.

NOTE

The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply a minimum of 0.12 inch (0.25 inch smaller in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

ai. Cut three plies of saturated glass fabric breather cloth to the size required.

aj. Paint repair surface with a thin layer of adhesive. Overlay repair with the three layers of glass fabric breather cloth saturated with adhesive.

ak. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

al. After cure, remove the plastic sheet and sand the stepped edges of glass fabric patches to a smooth contour with 240 grit abrasive paper.

am. Wipe area with clean, dry rymple cloth.

an. Replace finish (A1-F18AC-SRM-500, WP047 00).

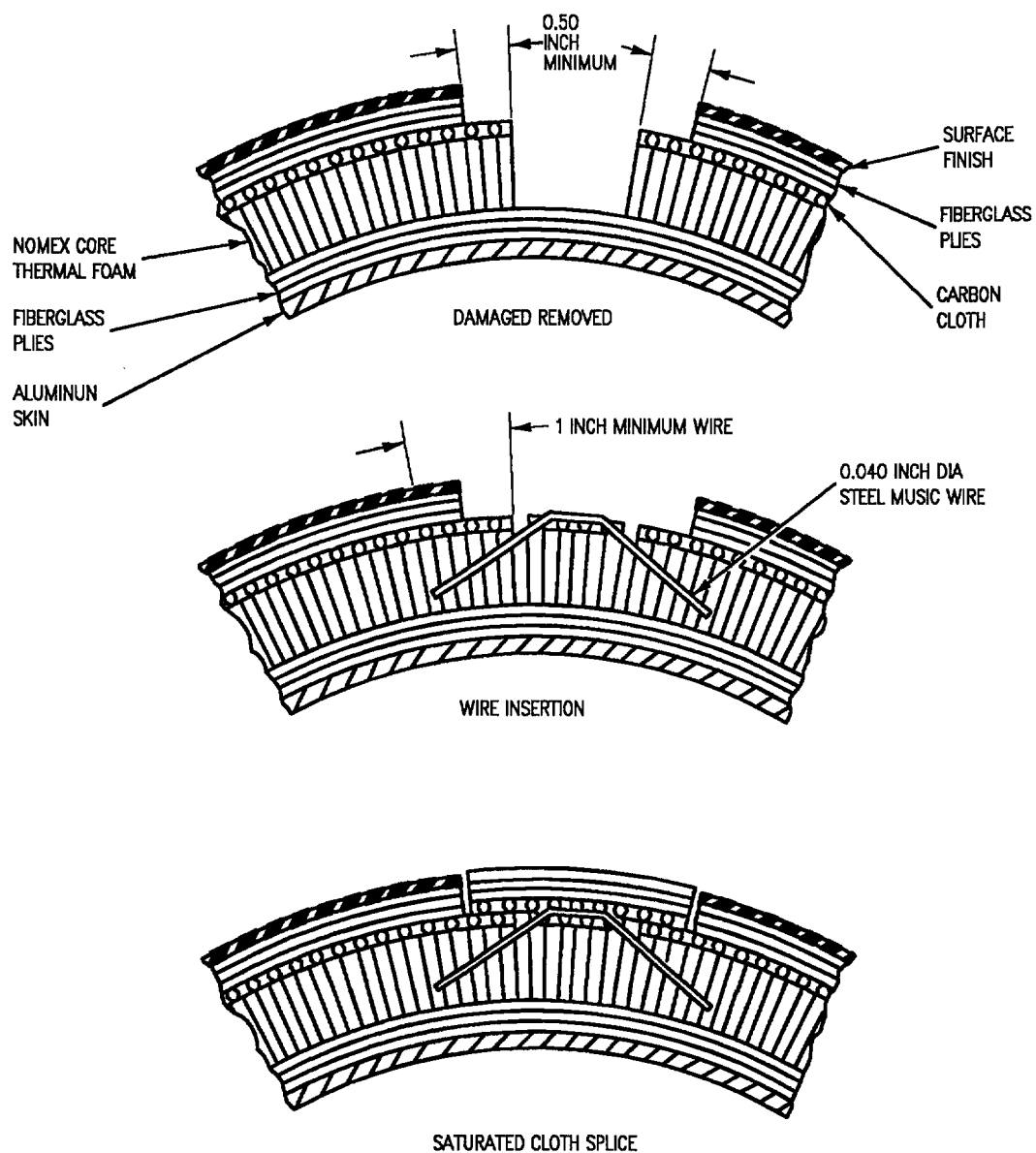


Figure 6. Class VII Damage Repair (Sheet 1)

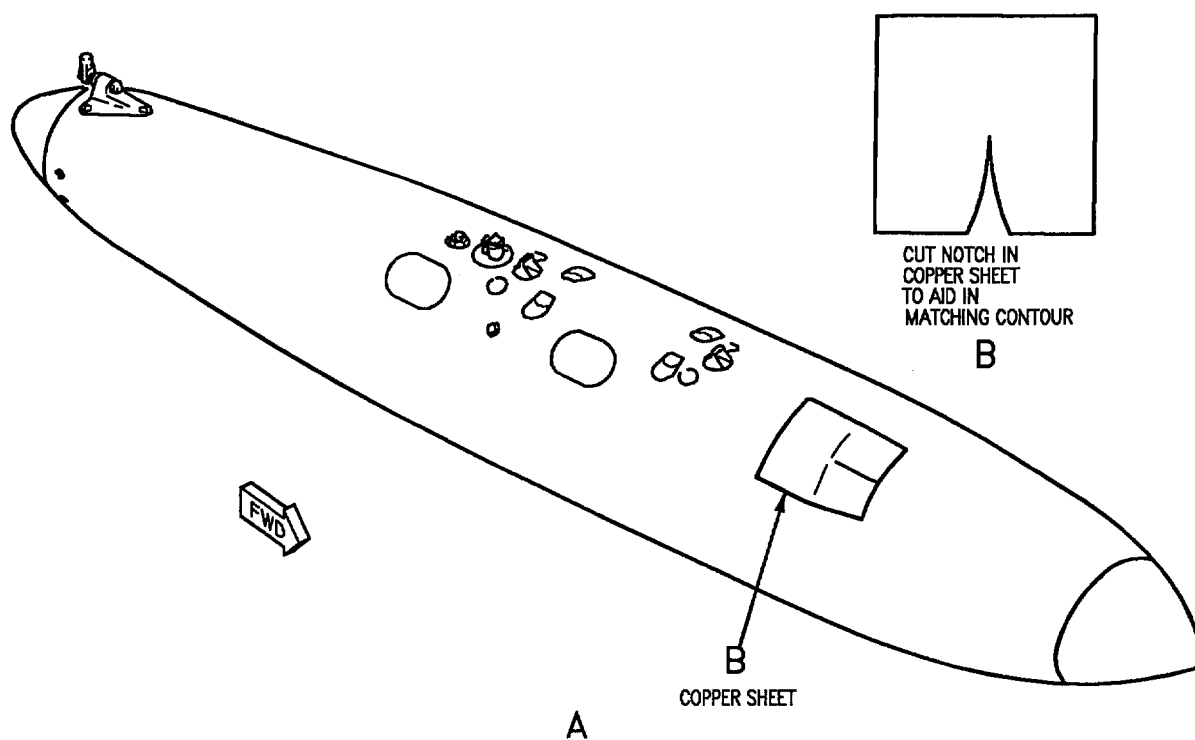
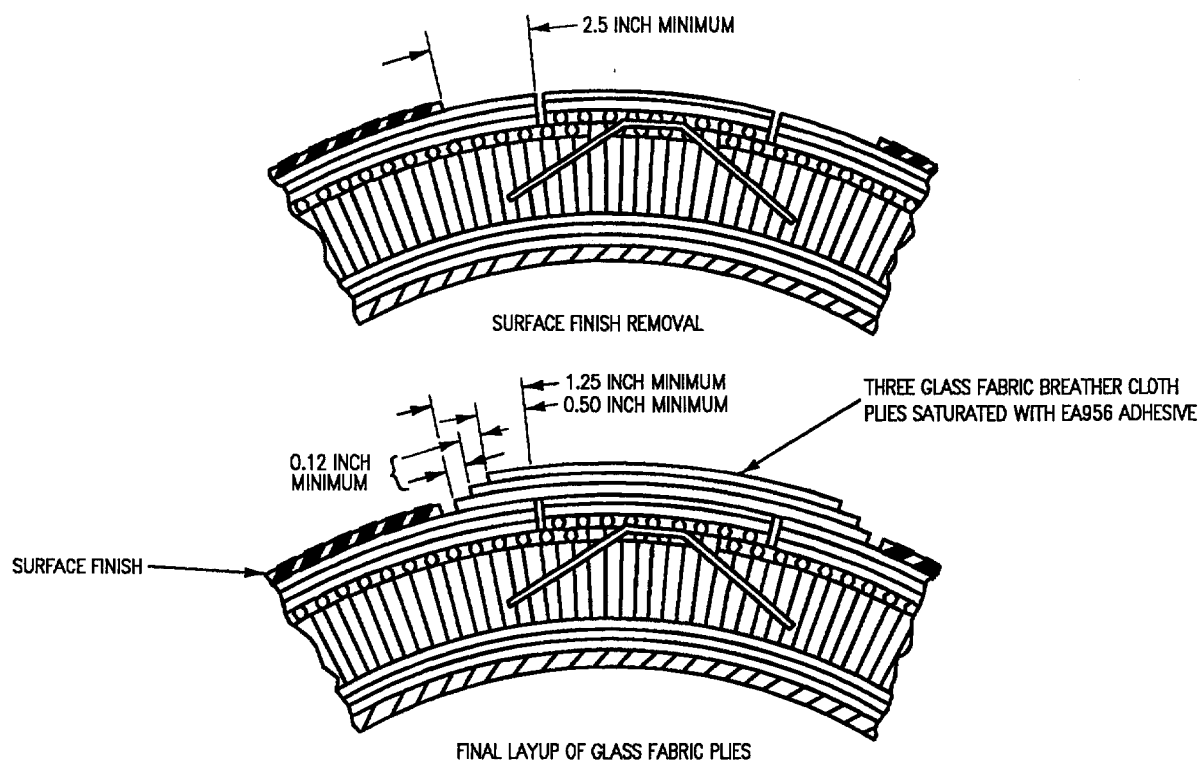


Figure 6. Class VII Damage Repair (Sheet 2)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

EXTERNAL FUEL TANK, ELLIPTICAL, PART NO. 74A550000

SURVIVABILITY WRAP CLASS VIII THRU X DAMAGE REPAIRS

Reference Material

Aircraft Corrosion Control	A1-F18AC-SRM-500
Elliptical External Fuel Tank, 74550000, Finish System and Markings	WP047 00
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	W0011 00
Structure Repair, Typical Repair	A1-F18AC-SRM-250
Curing of Repairs	WP004 00
Aluminum, Graphite Epoxy, or Titanium Patch Removal and Installation	WP007 00
Aircraft Weapons Systems Cleaning and Corrosion Control	NAVAIR 01-1A-509

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Edge Delamination	7
Class X Damage Repair	14
Positive Pressure Injection for Delamination	9
Vacuum Impregnation for Delamination at Fastener Hole	8

Record of Applicable Technical Directives

None

1. **CLASS VIII DAMAGE REPAIR.** See figure 1.

2. The procedures below describe repair to the fiberglass layer beneath damaged core.

Support Equipment Required

None

Materials Required

NOTE

Alternate item specifications or part numbers are listed in parentheses.

Nomenclature	Specification or Part Number
Adhesive	EA956
Annealed Copper Cloth, Satin	QQ-C-576, 0.020 Inch Thick
Core Material, Over-expanded Nomex Core, 0.250 Inch Thick	MIL-C-9084, Type 8, Class 2
Dry Woven Graphite Cloth, Satin Weave	MMS-715, Type 3
Gloves, Cotton Work, Men's	MMS-544
Isopropyl Alcohol Paper, Abrasive	MIL-G-3866, Type 1
Plastic Sheet	TT-I-735, Grade 1
Rymple Cloth	A-A-1047, Grit 180
Steel Music Wire	Grit 240
Tape, Pressure Sensitive	200SG40TR
Thermal Insulation	AMS-3819
	QQ-W-470, 0.040 Inch Thick
	855-1.000
	Trymer CPR9501
	(Themarest 5152)

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

c. Remove material from damaged area using a router bit, X-acto knife, chisel, and 180 grit abrasive paper. Remove damage to a circular or oval shape.

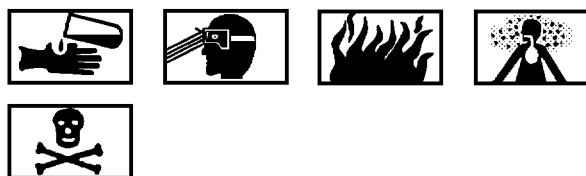
d. Vacuum clean the repair area.



Be careful not to damage aluminum shell.

e. Sand exposed metal tank surface with 180 grit abrasive paper and wipe with clean dry rymple cloth.

f. Dry repair area, Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).



Adhesive

19

g. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

h. Saturate a large piece of glass fabric breather cloth with adhesive.

i. Put plastic sheet on both sides of glass fabric and work out air bubbles using a roller or squeegee.

j. Measure diameter of repair area at aluminum skin surface if less, than 1 inch, do substep (1). If diameter of repair area at aluminum skin surface is more than or equal to 1 inch, do substep (2).

(1) Cut three plies of saturated glass fabric breather cloth to fill in repair area. Coat the aluminum surface with adhesive. Overlay the plies on repair. Continue with step k.

(2) Cut three plies of saturated glass fabric breather cloth with a minimum overlap of 0.25 inch each with a combined splice overlap of 0.75 inch minimum. Coat the aluminum surface with adhesive. Overlay the plies on repair.

k. Cut nomex core smaller than diameter of damage. See Table 1.

Table 1. Damage Diameter vs Core Diameter

Damage Diameter (Inches)	Subtractive Factor (Inch)
0-2	.0
2-4	0.05
4-8	0.08
8-12	0.12

Core Diameter = Damage Diameter - Subtractive Factor

l. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

m. Spread a layer of adhesive over bottom repair surface and exposed core using a small brush.

n. Spread adhesive on one side and periphery of nomex core plug.

NOTE

The core should be placed so as to give the best core cell flexibility to conform to tank curvature.

o. Center overexpanded nomex core into repair area. Place core into repair with the adhesive-covered side down.

p. Cut thermal insulation to the same diameter as nomex core.

q. Insert the overexpanded nomex core with thermal insulation using a roller. Roll the insulation into the core by working from the center out to the edges.

r. Fill any peripheral voids with adhesive.

s. Position a copper sheet (add weights if necessary) over the repair to hold in place. Cut notches in the sheet to aid in fitting to the contoured tank surface.

NOTE

To facilitate notching the copper sheet to fit the contour of external fuel tank, see figure 1, detail A. Position paper, or similar material, over the tank contour. Fold the material to

cause it to conform to the tank surface. Use folded material as a pattern for notching copper sheet.

t. Saturate a large layer of carbon cloth with adhesive. The carbon cloth shall be large enough to cut into two pieces, one the size of the core and another to overlap the core by a minimum 1/2-inch.

u. Put plastic sheet on both sides of carbon cloth and work out the air bubbles using a roller or squeegee.

v. Cut carbon cloth to size of core plug (orientation not important).

w. Remove copper sheet from repair.

x. Position saturated carbon cloth over core.

NOTE

Orient the wire in the hoop direction at approximately 1 inch spacing. A minimum of one wire per inch of damage opening in the longitudinal direction is required.

y. Trap the repair with 0.040 inch steel music wire inserted into the adjacent core a minimum of 1 inch using lockwire pliers.

z. Cut another piece of saturated carbon cloth to overlap the core plug and initial carbon cloth by a minimum of 1/2-inch.

aa. Overlay the saturated carbon cloth on the repair.

ab. Saturate a large piece of glass fabric breather cloth with adhesive.

ac. Put plastic sheet on both sides of glass fabric cloth and work out air bubbles using a roller or squeegee.

ad. Cut two plies of saturated glass fabric breather cloth to splice into the repair.

ae. Overlay the saturated glass fabric breather cloth plies on the repair.

af. Cure repair (A1-F18AC-SRM-250, WP004 00).

ag. Sand repair to smooth finish. Remove tank finish 2.5 inches from edge of damage.

ah. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

ai. Saturate a large piece of glass fabric breather cloth with adhesive.

aj. Put plastic sheet on both sides of glass fabric breather cloth and work out air bubbles using a roller or squeegee.

NOTE

The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply a minimum of 0.12 inch (0.25 inch small in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

ak. Cut three plies of saturated glass fabric breather cloth.

al. Paint repair surface with a thin layer of adhesive. Overlay the repair with the three layers of glass fabric breather cloth plies saturated with adhesive.

am. Cure repair (A1-F18AC-SRM-250, WP004 00).

an. After cure sand the stepped edges of fiberglass patches to a smooth contour with 240 grit abrasive paper.

ao. Wipe area with clean, dry rymple cloth.

ap. Replace finish (A1-F18AC-SRM-500, WP047 00).

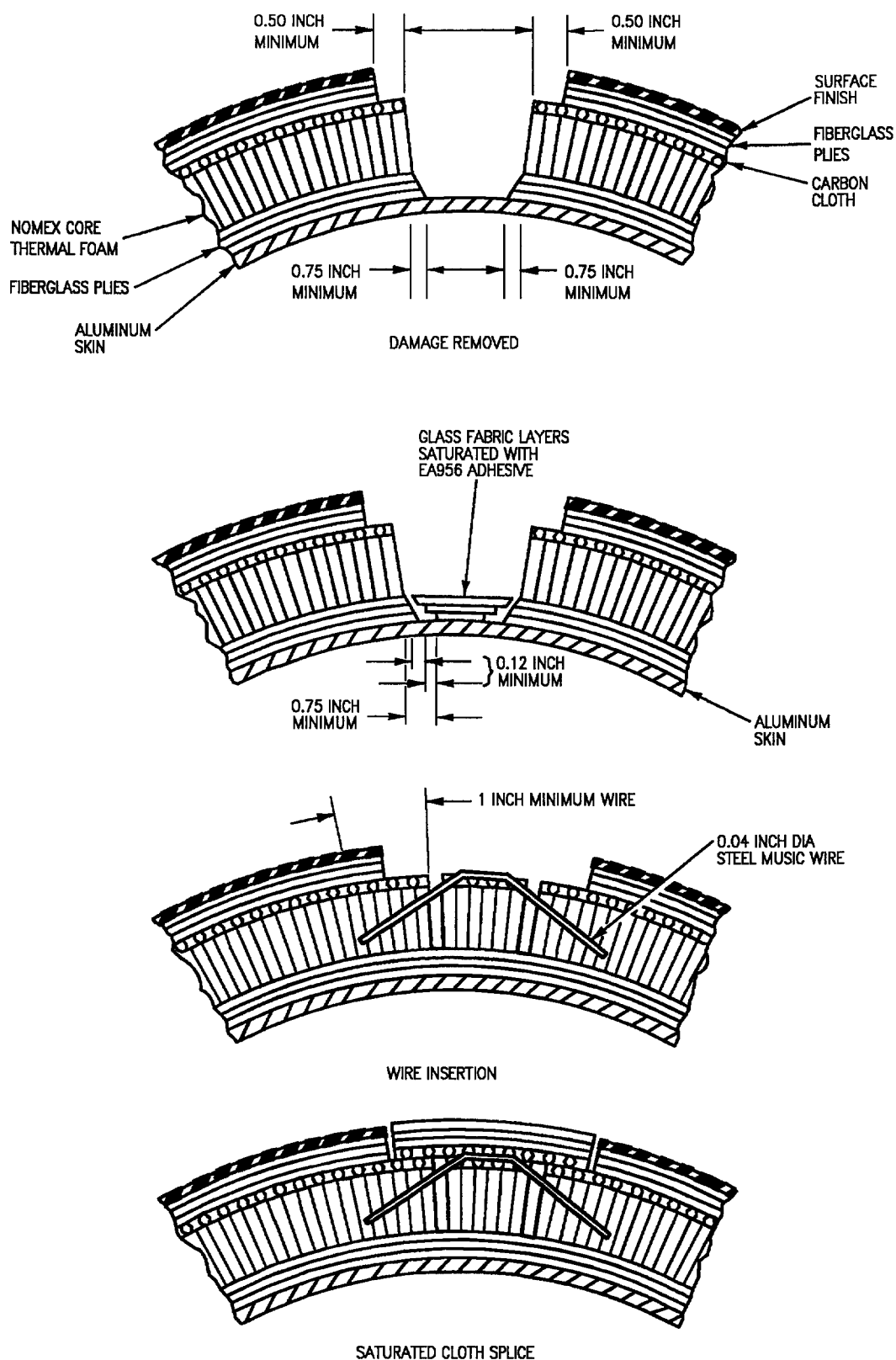


Figure 1. Class VIII Damage Repair (Sheet 1)

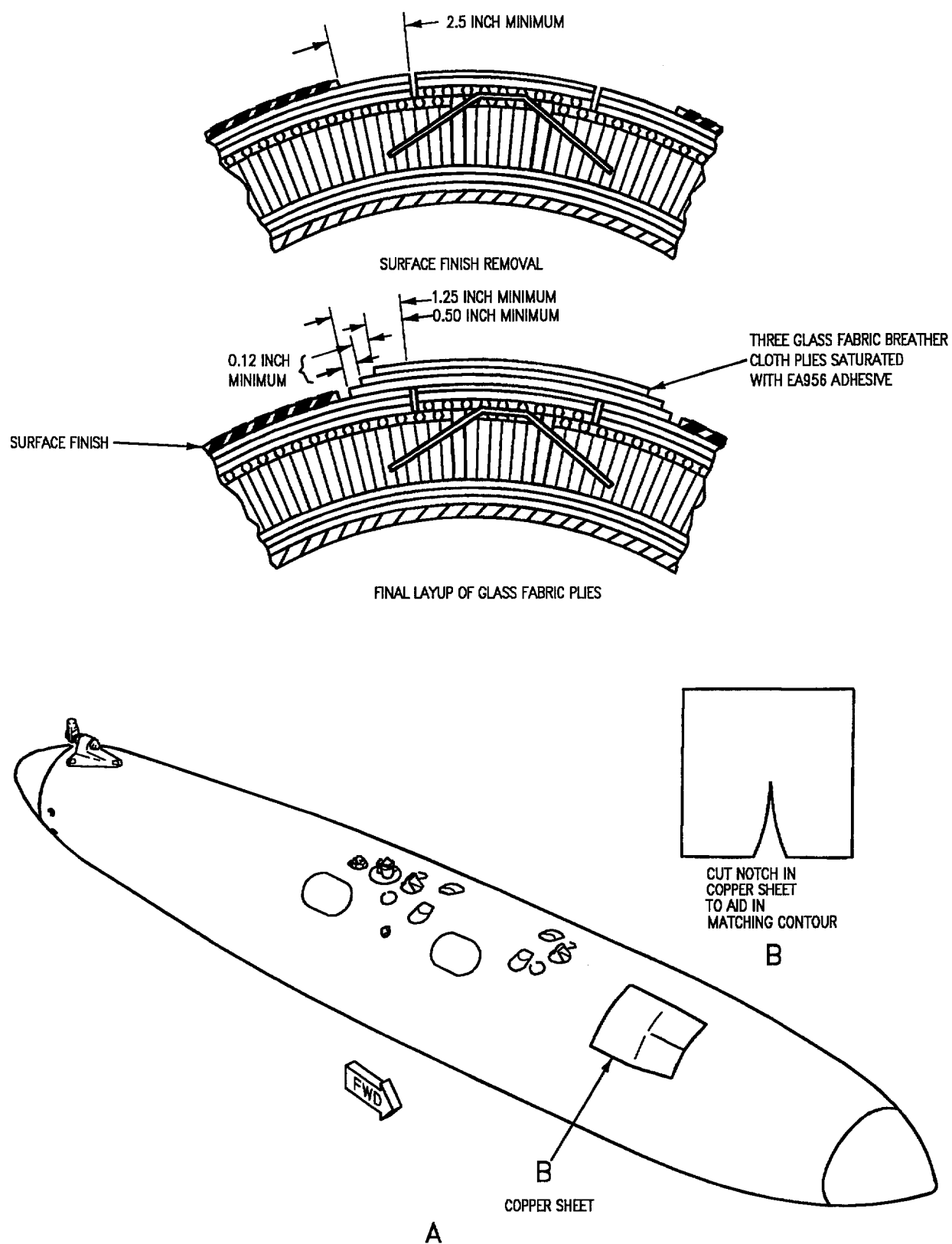


Figure 1. Class VIII Damage Repair (Sheet 2)

3. **CLASS IX DAMAGE REPAIR.** See figure 2.

4. This work package gives procedures for repair of damage to inserts in the solid laminate. Included are procedures for edge damage, edge delamination at the fastener hole.

5. **EDGE DAMAGE.** See section A.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA9321A/B
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
	Grit 240
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000
Tape, Vacuum Bag Sealant	9151-1-500

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

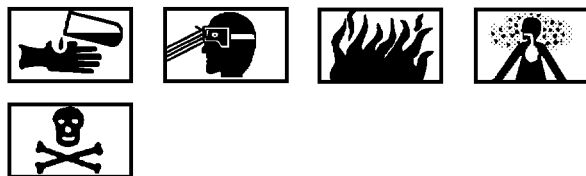


Use caution not to damage adjacent structure while removing damaged material.

c. Remove damaged material with a router. Use 180 grit abrasive paper to finish preparation of repair area.

d. Wipe the area clean with clean dry rymple cloth.

e. Block off the repair to the dimension desired. Prepare dam of sealant tape as needed.



Adhesive

2

f. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

g. Fill repair with adhesive using putty knife or brush.

h. Cure adhesive (A1-F18AC-SRM-250, WP004 00).

i. Lightly sand repaired area using 240 grit abrasive paper.

j. Wipe area with clean dry rymple cloth.

k. Replace finish (A1-F18AC-SRM-500, WP047 00).

6. **EDGE DELAMINATION.** See figure 2, Section B.

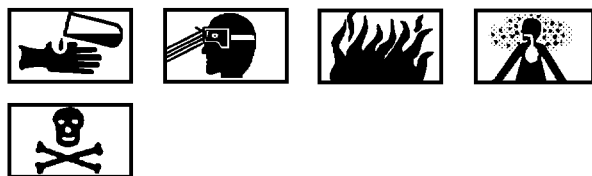
Support Equipment Required

Nomenclature	Part Number or Type Designation
Air Pressure Gage, 0 to 50 psi	-
Metal Backup Plate (2 Required)	1/8 Inch Thick, Size as Required to Cover Repair Number 250
Sealant Gun	-
Weights, for Stacking (Amount as Required to Apply 5 Pounds per Square Inch of Repair Area)	-

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Nozzle, Sealant Gun	420
Paper, Abrasive	A-A-1047, Grit 240
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

a. Tape separated edges of damaged area, keeping a small opening at each end.



Adhesive

20

b. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

c. Inject adhesive at 40 psi, using a sealant gun and nozzle, into one opening until it flows from the other opening. Allow adhesive to flow until clear.

d. Wipe off excess adhesive with clean dry rymple cloth.

e. Cover both openings with tape.

f. Apply pressure to repair using weights and backup plates.

g. Cure adhesive (A1-F18AC-SRM-250, WP004 00).

h. Remove weights backup plates and tape.



Be careful not to sand into part material, causing damage.

i. Sand repair area smooth using abrasive paper.

j. Wipe area with clean dry rymple cloth.

k. Replace finish (A1-F18AC-SRM-500, WP047 00).

7. VACUUM IMPREGNATION FOR DELAMINATION AT FASTENER HOLE. See figure 2, section C.

NOTE

This method is valid only for those cases in which delamination is restricted to carbon laminate and does not extend to core.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Heat Gun	-
Lexan Plate or Vacuum Chamber	-
Thermocouple	-
Torque Wrench	-
Vacuum Gage, 0 to 30 inch	-
Vacuum Pump, Hose, and Fittings	-

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Lubricant, Fluorocarbon	MS-122
Metal Plate	-
Paper, Abrasive	A-A-1047, Grit 240
Rymple Cloth	AMS-3819
Tape, Vacuum Bag Sealant	9151-1-500

a. Using section C of figure 2 as a guide, get a metal plate and aluminum ring of the size required. Use Table 2 to the correct size temporary fastener and washer.



Fluorocarbon Lubricant

20

b. Coat all the items in step (a) with teflon release agent in an area away from the repair. Allow teflon release agent to dry thoroughly before bringing these parts near the repair site.

c. Use sealant tape to attach the metal plate to one side of the skin per Section C. Place the aluminum ring around the hole as shown.

d. Form a dam of sealant tape around the hole as shown in section C to form a reservoir for extra adhesive.

e. Apply sealant tape to the lexan vacuum chamber and seal assembly shown in Section C. Apply vacuum of 24 to 29 inches of mercury and check for leaks.

f. If leaks are found, discontinue vacuum, adjust or add more sealant, and reapply vacuum. Again check for leaks. Repeat this step until there are no leaks.



Adhesive

19

g. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

h. Remove the lexan vacuum chamber from assembly and heat the skin around hole to 150°F using a heat gun and thermocouple. Hold at 150°F for 10 minutes.

i. Remove heat gun and fill the hole and reservoir with adhesive.

j. Attach the lexan chamber to the assembly and apply 24 to 29 inches of mercury vacuum.

k. Continue applying the vacuum for 5 minutes. Then vent the assembly to the atmosphere. Add more adhesive if necessary, then reseal the lexan chamber and apply vacuum for 5 more minutes.

l. Vent the assembly and remove the metal plate, aluminum ring, Lexan vacuum chamber, and all sealant and extra adhesive from the skin.

m. Locate the temporary fastener through the hole with a washer on each side of skin. Tighten fastener to the torque specified in Table 2 using a torque wrench.

n. Cure adhesive (A1-F18AC-SRM-250, WP004 00).

o. Remove fastener and clean up all excess adhesive.

p. Lightly sand repaired area using abrasive paper.

q. Wipe area with clean dry rymple cloth.

r. Replace finish (A1-F18AC-SRM-500, WP047 00).

8. POSITIVE PRESSURE INJECTION FOR DELAMINATION. See figure 2, section D.

NOTE

This procedure may be used for cases in which the delamination or unbond is open to core.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Cartridges, Sealant Gun	250-CP-2-1/2
Isopropyl Alcohol	TT-I-735, Grade 1
Nozzle, Sealant Gun	420
Paper, Abrasive	A-A-1047, Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000
Tubing, 1/2 Inch Surgical, Rubber, or Plastic	-



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

a. Wipe repair area with clean rymple cloth moistened with isopropyl alcohol.

b. Drill 1/8-inch diameter holes at each end of the delamination or unbond. Minimum spacing between holes is 1/2-inch for damage 1 inch or less. Do not drill closer than 1/2-inch from adjacent

fastener or edge of part. For delaminations or unbonds between 1 inch and 5 inches in diameter, drill 1/8-inch diameter holes at 1 inch spacing around perimeter of damage.

c. Make sure holes are located within the delaminations or unbonds:

(1) Fit sealing nozzles into the holes at each end of the delamination or unbond. Tape over intermediate holes with pressure sensitive tape.

(2) Attach a piece of tubing to one nozzle and submerge the other end in a container of water.

(3) Attach other nozzle to sealant gun cartridge without plunger and place cartridge in sealant gun. Attach a regulated source of compressed air to sealant gun.

(4) Apply pressure with air regulator set for 40 psi through the sealant gun into the delamination or unbond.

(5) Check water for bubbles to make sure air flow exists. If air flow exists, go to step d. If air flow does not exist, do steps b and c.

d. Remove nozzle from holes.

e. Tape separated edges of damaged area using pressure sensitive tape completely covering the opening.



Adhesive

19

f. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

g. Fill the delaminations or unbonds with adhesive:

(1) Inject adhesive at 40 psi, using a sealant gun and nozzle, into one hole and fill until adhesive flows clear from other hole. For delaminations or unbonds with more than two holes, inject adhesive into each hole until adhesive flows clear from all holes.

(2) Wipe off excess adhesive with clean dry rymple cloth.

h. Cover adhesive with tedlar film and cure repair (A1-F18AC-SRM-250, WP004 00).

i. Remove tedlar film and tape.

j. Lightly sand repaired area using abrasive paper.

k. Wipe area with clean dry rymple cloth.

l. Replace finish (A1-F18AC-SRM-500, WP047 00).

Table 2. Torque Values For GR/EP Hole Defect Repair Clamp-Up Bolts

Requirements

S Use Ti or CRES Hex Head Bolts

S Washer OD shall be large enough to extend a minimum of 0.06 inch beyond defect

Torque Values

<u>Diameter of Defective Hole</u>	<u>Clamp-Up Bolt Size</u>	<u>Torque Value - Max</u>
3/16	# 8-36	6.5 inch-lbs
1/4	# 10-32	7.5
5/16	1/4-28	10
3/8	5/16-24	12.5
7/16	3/8-24	15.5
1/2	7/16-20	18

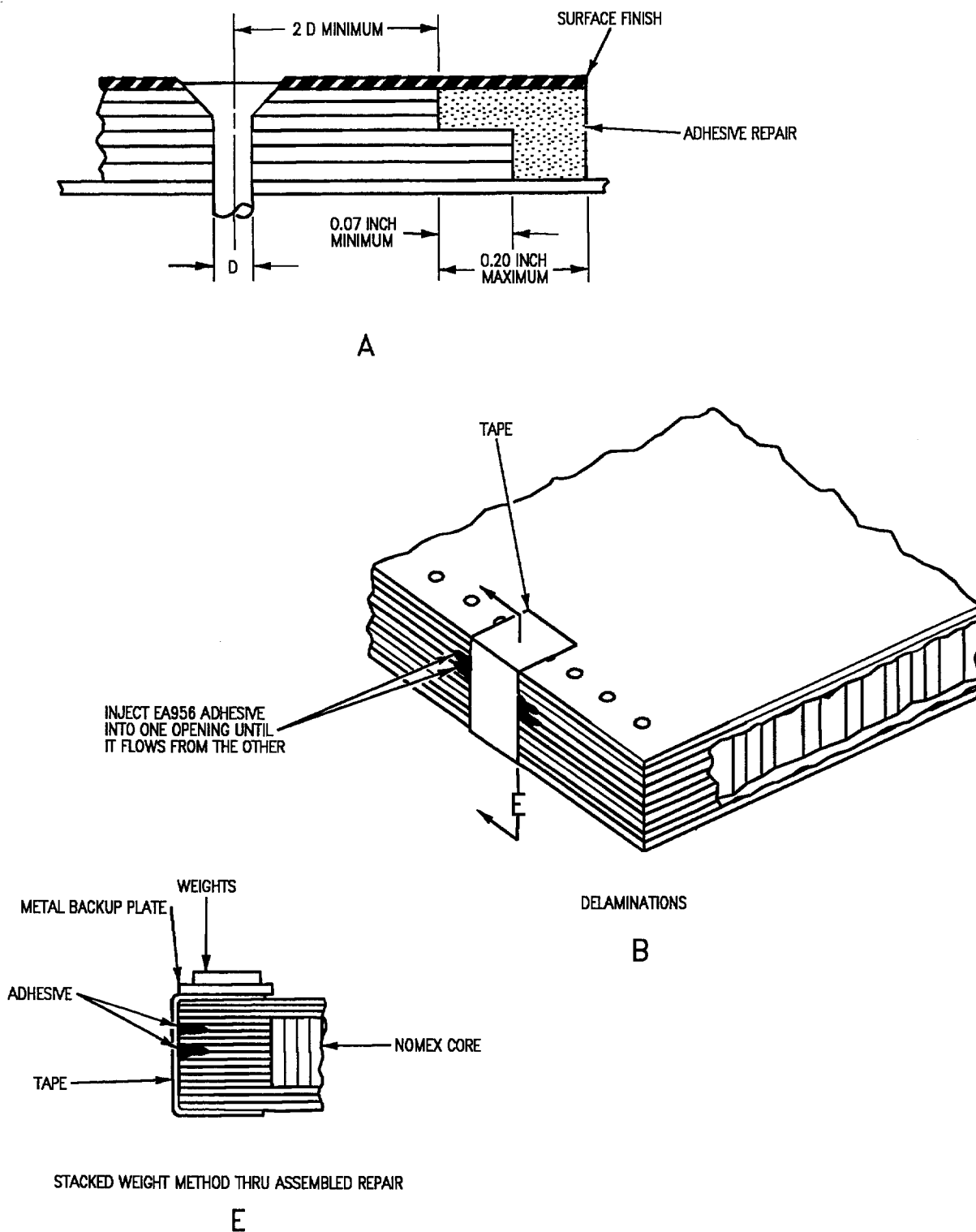


Figure 2. Class IX Damage Repair (Sheet 1)

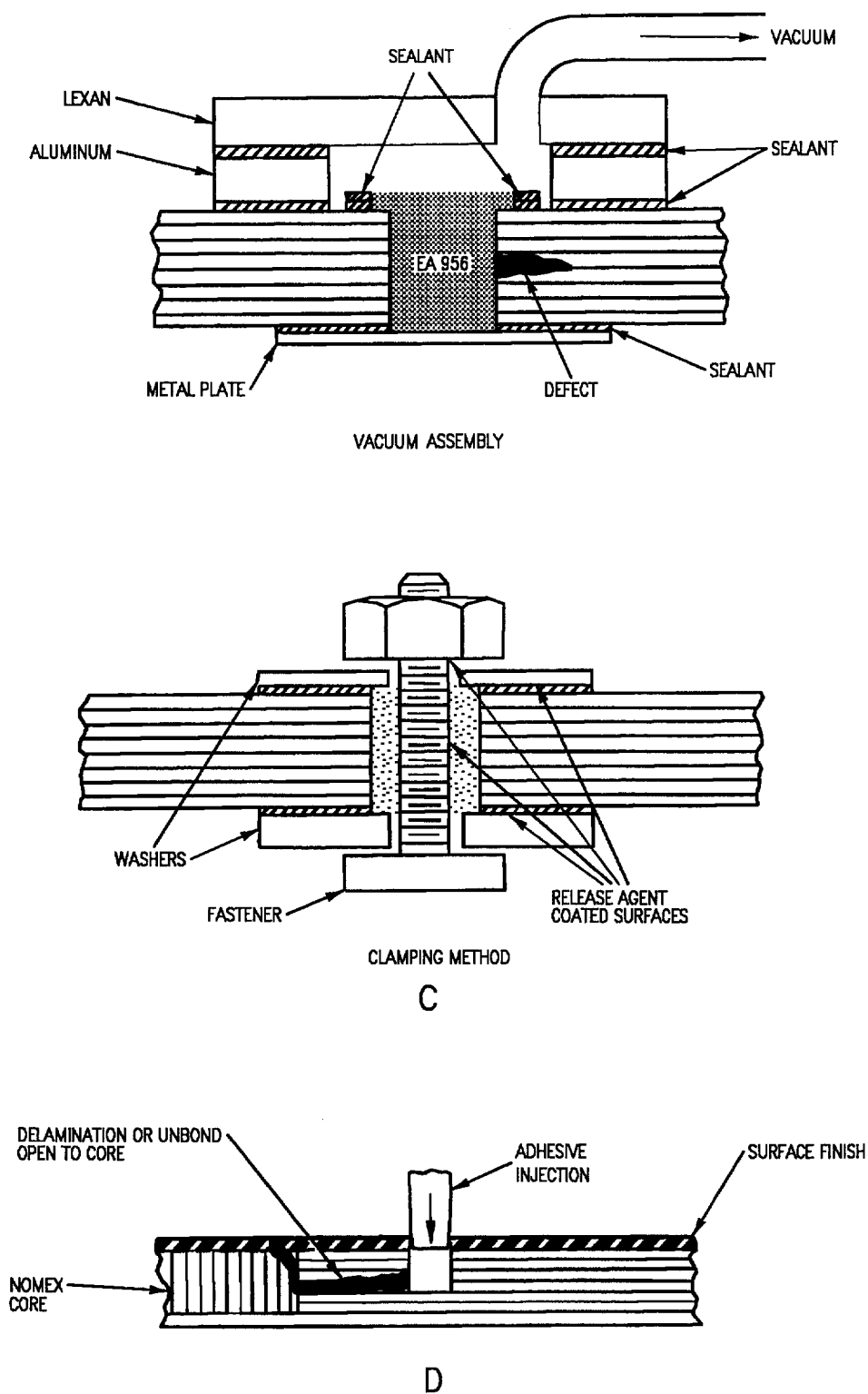


Figure 2. Class IX Damage Repair (Sheet 2)

9. **CLASS X DAMAGE REPAIR.** See figure 3.

10. This procedure describes repair of corroded aluminum skin.

Support Equipment Required

None

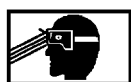
Materials Required

NOTE

Alternate item specifications or part numbers are shown indented.

Nomenclature	Specification or Part Number
Adhesive	EA956
Annealed Copper	QQ-C-576, 0.020 Inch Thick
Cloth, Satin	MIL-C-9084, Type 8, Class 2
Core Material, Over- expanded Nomex Core, 0.240 Inch Thick	MMS-715, Type 3
Dry Woven Graphite	MMS-544
Cloth, Satin Weave	
Gloves, Cotton Work, Men's	MIL-G-3866, Type 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
	Grit 240
Plastic Sheet	200SG40TR
Rymple Cloth	AMS-3819
Steel Music Wire	QQ-W-470, 0.040 Inch Thick
Tape, Pressure Sensitive	855-1.000
Thermal Insulation	Trymer CPR9501

a. Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto rymple cloth. Never dip rymple cloth into isopropyl alcohol.

b. Wipe unmasked area with clean rymple cloth moistened with isopropyl alcohol.

c. Remove material from damaged area using a router bit, X-acto knife, chisel, and 180 grit abrasive paper. Remove damage to a circular or oval shape.

d. Vacuum clean the repair area.



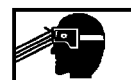
Be careful not to cause more damage to the aluminum shell when removing corrosion.

e. Remove aluminum skin corrosion (NAVAIR 01-1A-509).

f. Clean area with clean dry rymple cloth.

g. Verify that the remaining thickness is more than or equal to 80 percent of the initial thickness.

h. Dry repair area, Drying Sandwich Structure (A1-F18AC-SRM-250, WP007 00).



Adhesive

19

i. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

j. Saturate a large piece of glass fabric breather cloth with adhesive.

k. Put plastic sheet on both sides and work out air bubbles using a roller or squeegee.

l. Measure diameter of repair area at aluminum skin surface if less, than 1 inch, do substep (1). If

diameter of repair area at aluminum skin surface is more than or equal to 1 inch, do substep (2).

(1) Cut three plies of saturated glass fabric breather cloth to fill in repair area. Coat aluminum surface with adhesive. Overlay the plies on repair. Continue with step m.

(2) Cut three plies of saturated glass fabric breather cloth with a minimum overlap of 0.12 inch each with a combined splice overlap of 0.75 inch minimum. Coat the aluminum surface with adhesive. Overlay the plies on the repair.

m. Cut nomex core smaller than diameter of damage. See Table 3.

Table 3. Damage Diameter vs Core Diameter

Damage Diameter (Inches)	Subtractive Factor (Inch)
0-2	0
2-4	0.05
4-8	0.08
8-12	0.12

Core Diameter = Damage Diameter - Subtractive Factor

n. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

o. Spread a layer of adhesive over bottom repair surface and exposed core using a small brush.

p. Spread adhesive on one side and periphery of overexpanded nomex core plug.

NOTE

The core should be placed so as to give the best core cell flexibility to conform to tank curvature.

q. Center overexpanded nomex core into repair area. Place core into repair with the adhesive-covered side down.

r. Cut thermal insulation to the same diameter as the overexpanded nomex core.

s. Insert the overexpanded nomex core with thermal insulation using a roller. Roll the insulation into the core by working from the center out to the edges.

t. Fill any peripheral voids with adhesive.

u. Position a copper sheet (add weights if necessary) over the repair to hold it in place. Cut notches in sheet to aid in fitting the contoured tank surface.

NOTE

To facilitate notching the copper sheet to fit the contour of external fuel tank, see figure 3, detail A. Locate paper, or similar material, over the tank contour. Fold the material to cause it to conform to the tank surface. Use folded material as a pattern for notching copper sheet.

v. Saturate a large layer of carbon cloth with adhesive. The carbon cloth shall be large enough to cut into two pieces, one the size of the core and another to overlap the core by a minimum 1/2-inch.

w. Put plastic sheet on both sides and work out the air bubbles using a roller or squeegee.

x. Cut cloth to size of core plug (orientation not important).

y. Remove copper sheet from repair.

z. Position saturated carbon cloth over core.

NOTE

Orient the wire in the hoop direction at approximately 1 inch spacing. A minimum of one wire per inch of damage opening in the longitudinal direction is required.

aa. Trap the repair with steel music wire inserted into the adjacent core a minimum of 1 inch using lock wire pliers.

ab. Cut another saturated cloth to overlap the core plug and initial carbon cloth by a minimum of 1/2 inch.

ac. Overlay the saturated carbon cloth on the repair.

ad. Saturate a large piece of glass fabric breather cloth with adhesive.

ae. Put plastic sheet on both sides of glass fabric and work out air bubbles using a roller squeegee.

af. Cut two plies of saturated glass fabric breather cloth to splice into the repair.

ag. Overlay the saturated breather cloth plies on the repair.

ah. Cure repair (A1-F18AC-SRM-250, WP004 00).

ai. Sand repair to smooth finish. Remove tank finish 2.5 inches from edge of damage.

aj. Prepare adhesive (A1-F18AC-SRM-200, WP011 00).

ak. Saturate a large piece of glass fabric breather cloth with adhesive.

al. Put plastic sheet on both sides of glass fabric and work out air bubbles using a roller or squeegee.

NOTE

The bottom ply shall overlap damage area a minimum of 1.25 inch. The middle ply shall be smaller than the lower ply a minimum of 0.12 inch (0.25 inch small in diameter). The top ply shall overlap damage area by 0.5 inch minimum.

am. Cut three plies of saturated glass fabric breather cloth.

an. Paint repair surface with a thin layer of adhesive. Overlay the repair with the three layers of glass fabric breather cloth saturated with adhesive.

ao. Cure adhesive (A1-F18AC-SRM-250, WP004 00).

ap. After cure, sand the stepped edges of the glass fabric patches to a smooth contour with 240 grit abrasive paper.

aq. Wipe area with clean, dry rymple cloth.

ar. Replace finish (A1-F18AC-SRM-500, WP047 00).

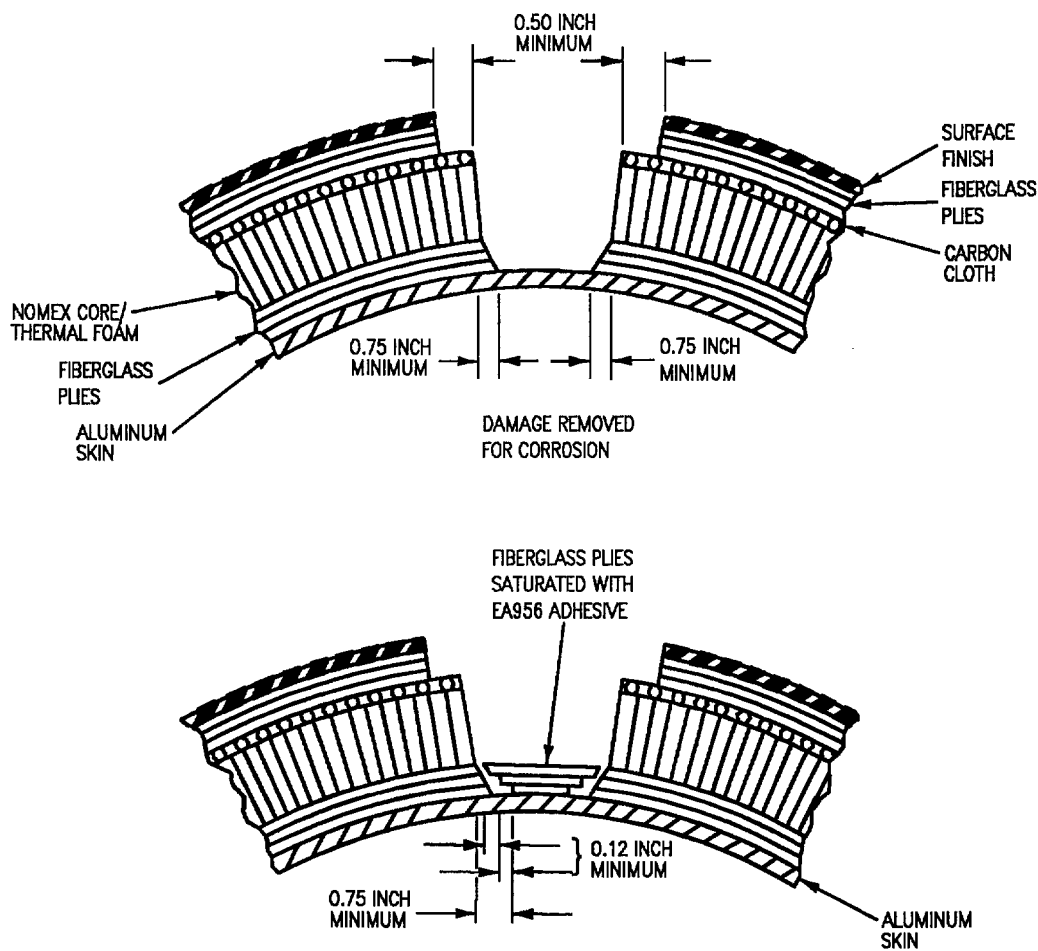


Figure 3. Class X Damage Repair (Sheet 1)

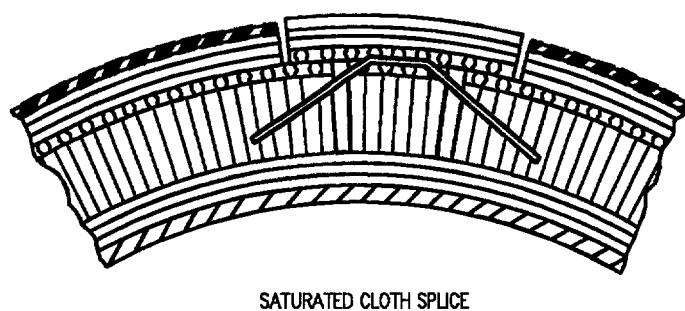
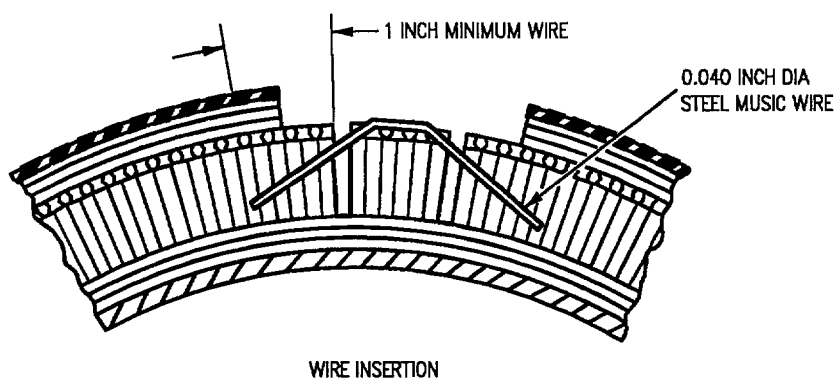


Figure 3. Class X Damage Repair (Sheet 2)

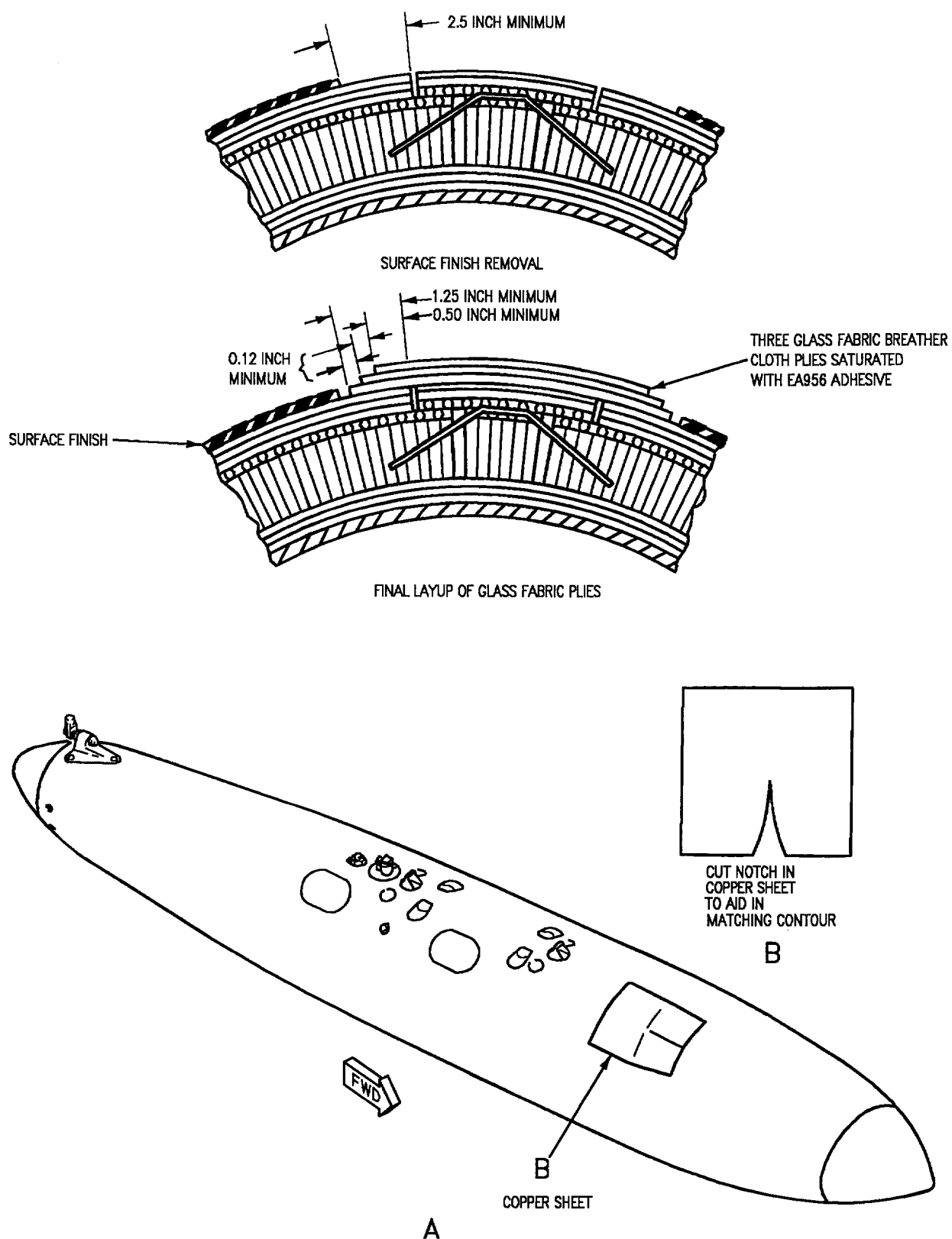


Figure 3. Class X Damage Repair (Sheet 3)

ORGANIZATIONAL AND INTERMEDIATE MAINTENANCE

STRUCTURE REPAIR

EXTERNAL FUEL TANK, ELLIPTICAL, PART NO. 74A550000

METAL REPAIR

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
External Fuel Tank, Elliptical, Part No. 74A550000	WP024 00
External Fuel Tank, Elliptical, Part No. 74A550000, Survivability	
Wrap Class VIII thru X Damage Repair	WP024 02
Airborne Weapons/Stores Landing Manual	A1-F18AC-LWS-000
Aircraft Corrosion Control	A1-F18AC-SRM-500
Elliptical External Fuel Tank, 74A550000, Finish System and Markings	WP047 00
External Fuel Tank FPU-6A and FPU-8A, Part Numbers 74A550000-1021 and 74A551000-1005 ..	A1-471AC-460-030
External Fuel Tank FPU-6A, Fuel System Installation - Disassembly	WP007 00
External Fuel Tank FPU-6A, Fuel System Installation - Assembly	WP009 00
Fuel System	A1-F18AC-460-300
Ground Support Equipment	WP009 01
Fuel Tank Maintenance, Precautions and General Preparation	WP013 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Plane Captain Manual	A1-F18AC-PCM-000
Structure Repair, General Information	A1-F18AC-SRM-200
Adhesive, Cement, and Sealant; Preparation and Application	WP011 00
Structure Repair, Typical Repair	A1-F18AC-SRM-250
Curing of Repairs	WP004 00
Aluminum Patch Fabrication	WP006 01
Aluminum, Graphite Epoxy, or Titanium Patch Installation and Removal	WP007 00
Engineering Series for Aircraft Repair	NAVAIR 01-1A-9

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Record of Applicable Technical Directives

None

1. REPAIR PROCEDURES.

Support Equipment Required

None

2. Application of repair procedures one through four are specified by damage evaluation (WP024 00). Repair procedures that do not require welding are organizational maintenance. Welding is intermediate maintenance.

Materials Required

3. COMBUSTIBLE AND TOXIC GAS INDICATOR.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Toxic and Combustible Gas Indicator	72-8001

Materials Required

None

a. Set indicator (A1-F18AC-460-300, WP009 01).

b. To inspect for 20 percent of lower explosive limit set PPM/LEL switch to LEL (out) position.

c. To inspect for 5 percent of lower explosive limit set PPM/LEL switch to PPM (in) position.

4. PURGING PROCEDURES.

Nomenclature

Specification or Part Number

Apron, Utility
Gloves, Chemical
STYLE 1

MIL-A-41829
ZZ-G-381, TYPE 1,

a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).

b. Ground tank and purging equipment, and air purge with facility air, changing positions occasionally to circulate air through all portions of the tank.

c. Continue circulation until the fuel/air concentration is less than 20 percent of the lower explosive limit as indicated on the indicator, per Combustible and Toxic Gas Indicator, this WP.

d. Remove doors 505 and 506 (A1-F18AC-LMM-010).

e. Remove tank fuel system components (A1-F18AC-460-300, WP007 00).

- (1) Electrical Cable Assembly.
- (2) Manual Precheck Valve.
- (3) Fuel Quantity Transmitter.
- (4) Pressurization and Vent Valve.
- (5) Pressure Relief Valve.

f. Install doors 505 and 506 (A1-F18AC-LMM-010).



Make sure tank is correctly supported, weight of water could cause structural damage.

g. Attach a drain to air inlet and fill tank with water through the fuel inlet allowing water to overflow for a minimum of 5 minutes.

h. Drain water from tank.

i. Remove doors 505 and 506 (A1-F18AC-LMM-010).

WARNING

Steam will cause serious damage if not handled correctly. Wear rubber gloves, rubber apron and protective face shield. If steam burns eyes or skin report to medical facility.

j. Direct steam into tank through access doors, directing steam onto as many of the internal surfaces as possible.

k. Continue steam cleaning until the fuel/air concentration is less than 5 percent of the lower explosive limit as indicated on the indicator, per Combustible and Toxic Gas Indicator, this WP.

5. REPAIR PROCEDURE ONE.

6. REMOVAL OF EXTERNAL FUEL TANK.

- a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).
- b. Defuel external fuel tank (A1-F18AC-PCM-000).
- c. Drain residual fuel per substeps below:

- (1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel



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WARNING

To prevent personal injury, do not stand directly under drain valve.

- (2) Open drain valve.

- (3) Close drain valve when residual fuel has drained.

d. Remove external fuel tank (A1-F18AC-LWS-000).

e. Purge external fuel tank until a safe indication is displayed on the indicator, per paragraphs 3 and 4.

7. REPAIRS. See figure 1.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

Nomenclature	Specification or Part Number
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before welding per purging procedures. Fuel presence while welding will cause fire and/or explosion.

- a. Remove survivability wrap:

(1) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4



To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

(2) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

NOTE

Remove material so that a 2 inch clearance exist between wrap and damage on all sides.

(3) Remove damaged material using a router bit, X-acto knife, and abrasive paper.

(4) Vacuum clean repair area.

WARNING

Before welding, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Damage is repaired by welding (NAVAIR 01-1A-9).

c. Welding must be completed in one pass.

d. No heat treatment after welding.

e. Repairs must maintain contour smoothness.

f. Install doors 505 and 506 (A1-F18AC-LMM-010).

g. Leak test repairs, with the test set-air leakage, external fuel tank (1) per substeps below:

(1) Fill tank with water.

(2) Install adapter (3) on fuel/air coupling.

(3) Install connector (2) to adapter (3).

(4) Connect facility air to connector (2).

(5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gage (4) from tank.

(10) Drain water from tank.

h. Remove doors 505 and 506 (A1-F18AC-LMM-010).

i. Install tank fuel system components (A1-471AC-460-030, WP009 00):

(1) Pressure Relief Valve.

(2) Pressurization and Vent Valve.

(3) Fuel Quantity Transmitter.

(4) Manual Precheck Valve.

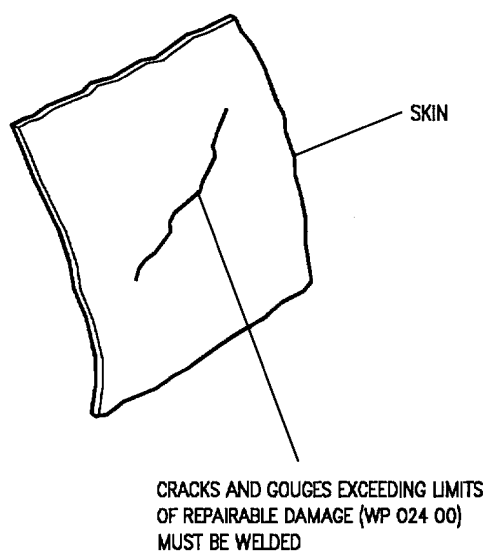
(5) Electrical Cable Assembly.

j. Install doors 505 and 506 (A1-F18AC-LMM-010).

k. Repair survivability wrap, per class VIII damage repair (WP024 02).

l. Refinish repaired areas (A1-F18AC-SRM-500, WP047 00).

8. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).



LEGEND

1. FLUSH AND CLEAN TANK BEFORE WELDING
2. CLEAN CRACK OR GOUGE THOROUGHLY BEFORE WELDING

Figure 1. Repair Procedure One (Sheet 1)

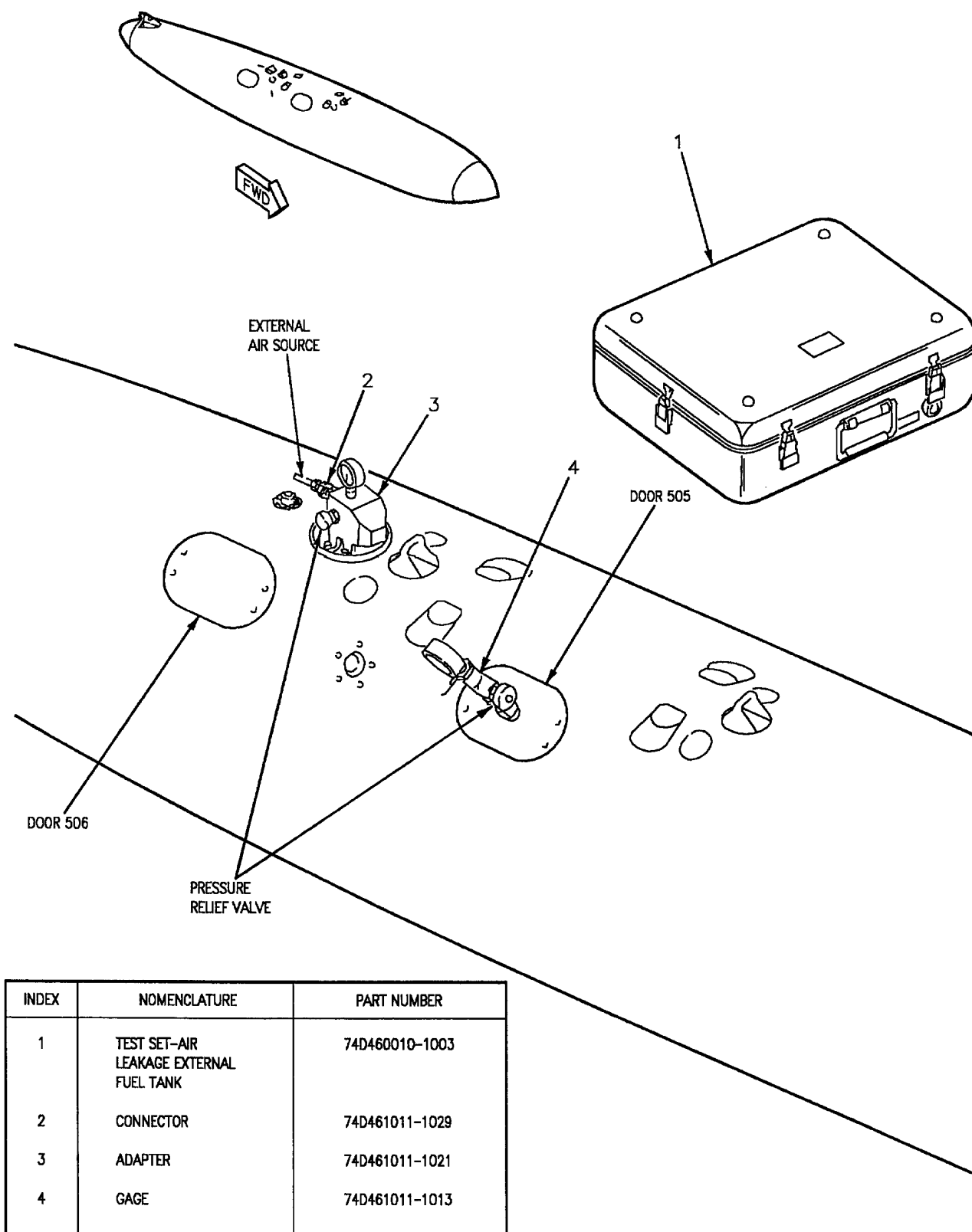


Figure 1. Repair Procedure One (Sheet 2)

9. REPAIR PROCEDURE TWO.

10. REMOVAL OF EXTERNAL FUEL TANK.

- a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).
- b. Defuel external fuel tank (A1-F18AC-PCM-000).
- c. Drain residual fuel per paragraphs below:

(1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel



22

WARNING

To prevent personal injury, do not stand directly under drain valve.

(2) Open drain valve.

(3) Close drain valve when residual fuel has drained.

d. Remove external fuel tank (A1-F18AC-LWS-000).

e. Purge external fuel tank until a safe indication is displayed on the indicator, per Combustible and Toxic Gas Indicator, and Purging Procedures, this WP.

11. REPAIRS. See figure 2.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

Nomenclature	Specification or Part Number
Aluminum Sheet, 4 Inch by 4 Inch	6061-T6, 0.040 Inch Thick
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before welding per purging procedures. Fuel presence while welding will cause fire and/or explosion.

a. Remove survivability wrap:

(1) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4

CAUTION

To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

(2) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

NOTE

Remove material so that a 2 inch clearance exists between wrap and damage on all sides.

(3) Remove damaged material using a router bit, X-acto knife, and 180 grit abrasive paper.

(4) Vacuum clean repair area.

WARNING

Before welding, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Damage is repaired by welding (NAVAIR 01-1A-9).

c. Damage is repaired by plug patch.

d. Remove damage to a circular or oval shape, which best fits the damage.

e. Limit repairs to substeps below:

(1) Plug patch material must be 6061-T6 aluminum alloy, 0.040 inch thick.

(2) Patches to be formed before welding.

(3) Welding must be completed in one pass.

(4) No heat treatment after welding.

(5) Repairs must maintain contour smoothness.

(6) Damage not to exceed 1.5 inches in diameter.

f. Install doors 505 and 506 (A1-F18AC-LMM-010).

g. Leak test repairs, with the test set-air leakage, external fuel tank (1) per substeps below:

(1) Fill tank with water.

(2) Install adapter (3) on fuel/air coupling.

(3) Install connector (2) to adapter (3).

(4) Connect facility air to connector (2).

(5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gage (4) from tank.

(10) Drain water from tank.

h. Remove doors 505 and 506 (A1-F18AC-LMM-010).

i. Install tank fuel system components (A1-471AC-460-030, WP009 00):

(1) Pressure Relief Valve.

(2) Pressurization and Vent Valve.

(3) Fuel Quantity Transmitter.

(4) Manual Precheck Valve.

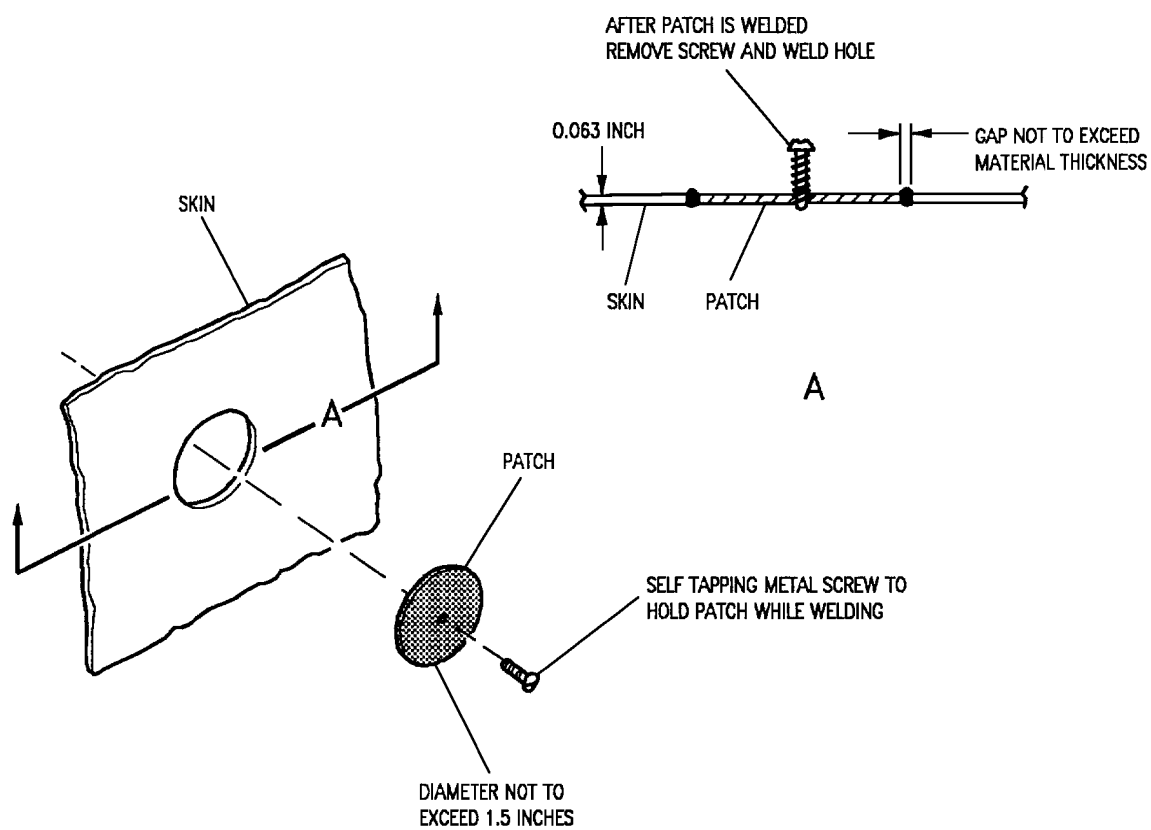
(5) Electrical Cable Assembly.

j. Install doors 505 and 506 (A1-F18AC-LMM-010).

k. Repair survivability wrap, per class VIII damage repair (WP024 02).

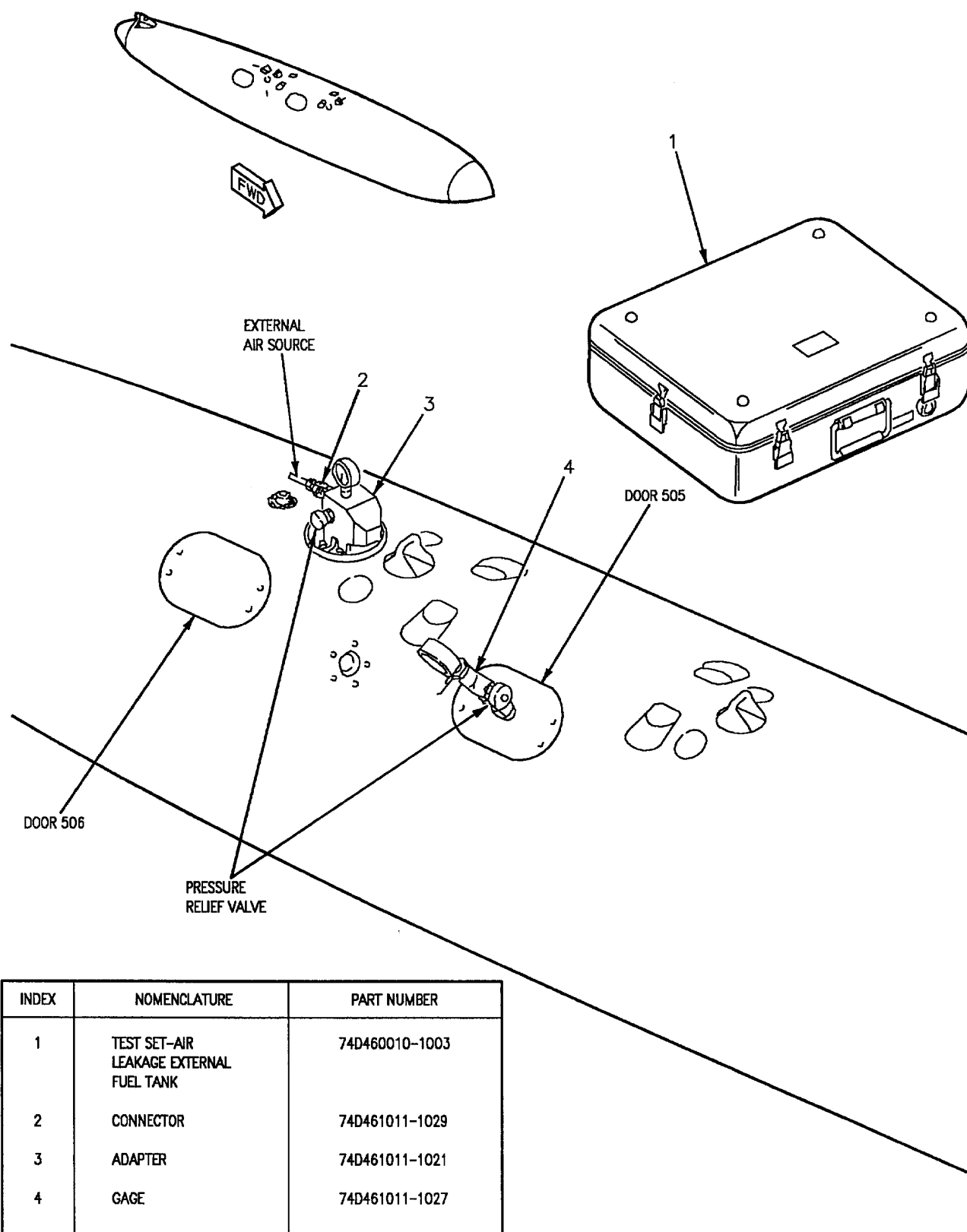
l. Refinish repaired areas (A1-F18AC-SRM-500, WP047 00).

12. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).

**LEGEND**

FLUSH AND CLEAN TANK BEFORE WELDING

Figure 2. Repair Procedure Two (Sheet 1)



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Figure 2. Repair Procedure Two (Sheet 2)

13. REPAIR PROCEDURE THREE.

14. REMOVAL OF EXTERNAL FUEL TANK.

a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).

b. Defuel external fuel tank (A1-F18AC-PCM-000).

c. Drain residual fuel per substeps below:

(1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel



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WARNING

To prevent personal injury, do not stand directly under drain valve.

(2) Open drain valve.

(3) Close drain valve when residual fuel has drained.

d. Remove external fuel tank (A1-F18AC-LWS-000).

e. Purge external fuel tank until a safe indication is displayed on the indicator, per Combustible and Toxic Gas Indicator, and Purging Procedures, this WP.

15. REPAIRS. See figure 3.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Adhesive	FM300
Aluminum Patch	18AC-SRM-A1 Fabricate (WP006 01)
Aluminum Sheets, 4 Inch by 4 Inch	6061-T6, 0.032 and 0.040 Inch Thick
Apron, Utility	MIL-A-41829
Gloves, Chemical	ZZ-G-381, Type 1, Style 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before welding per purging procedures. Fuel presence while welding will cause fire and/or explosion.

a. Remove survivability wrap:

(1) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol

4

CAUTION

To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

(2) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

NOTE

Remove material so that a 3.5 inch clearance exists between wrap and damage on all sides.

(3) Remove damaged material using a router bit, X-acto knife, and 180 grit abrasive paper.

(4) Vacuum clean repair area.

WARNING

Before welding, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Damage is repaired by welding (NAVAIR 01-1A-9).

c. Repair damage by a welded plug and bonded-patch.

d. Remove damage to a circular or oval shape, which best fits the damage.

e. Limit repairs to substeps below:

(1) Plug material is 6061-T6 aluminum alloy, 0.040 inch thick.

(2) Patch material is 6061-T6 aluminum alloy, 0.032 inch thick.

(3) Patch and plug to be formed before welding and bonding.

(4) Damage not to exceed 2.5 inches in diameter in zones III, IV, and VI.

(5) Bonded patch overlaps damage by 1.5 inches.

f. Procedures for welding.

(1) Form plug to fit trimmed out damage and weld in place (NAVAIR 01-1A-9).

(2) Install doors 505 and 506 (A1-F18AC-LMM-010).

g. Leak test repairs with the test set-air leakage, external fuel tank (1) per substeps below:

(1) Fill tank with water.

(2) Install adapter (3) on fuel/air coupling.

(3) Install connector (2) to adapter (3).

(4) Connect facility air to connector (2).

(5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gage (4) from tank.

(10) Drain water from tank.

h. Remove doors 505 and 506 (A1-F18AC-LMM-010).

i. Install tank fuel system components (A1-471AC-460-300, WP009 00).

(1) Pressure Relief Valve.

(2) Pressurization and Vent Valve.

(3) Fuel Quantity Transmitter.

(4) Manual Precheck Valve.

(5) Electrical Cable Assembly.

j. Install doors 505 and 506 (A1-F18AC-LMM-010).

k. Procedures for bonding of patch.

(1) Select applicable patch (A1-F18AC-SRM-250, WP006 01).

(2) Prepare repair area where patch will be bonded using 180 grit abrasive paper.

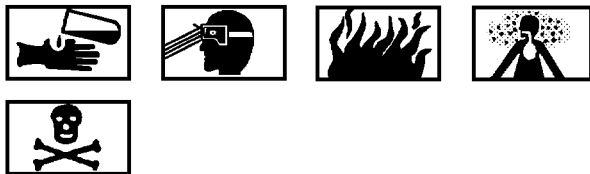


Adhesive

22

(3) Prepare FM 300 adhesive (A1-F18AC-SRM-200, WP011 00).

(4) Install patch, Aluminum Patch Installation (A1-F18AC-SRM-250, WP007 00).



Adhesive

19

(5) Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

(6) Fill area between wrap and patch, using EA956 adhesive. Fill area until adhesive is flush with patch.

(7) Cure adhesive (A1-F18AC-SRM-250, WP004 00).

l. Replace survivability wrap, per class VIII damage (WP024 02).

m. Refinish repaired areas (A1-F18AC-SRM-500, WP047 00).

16. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).

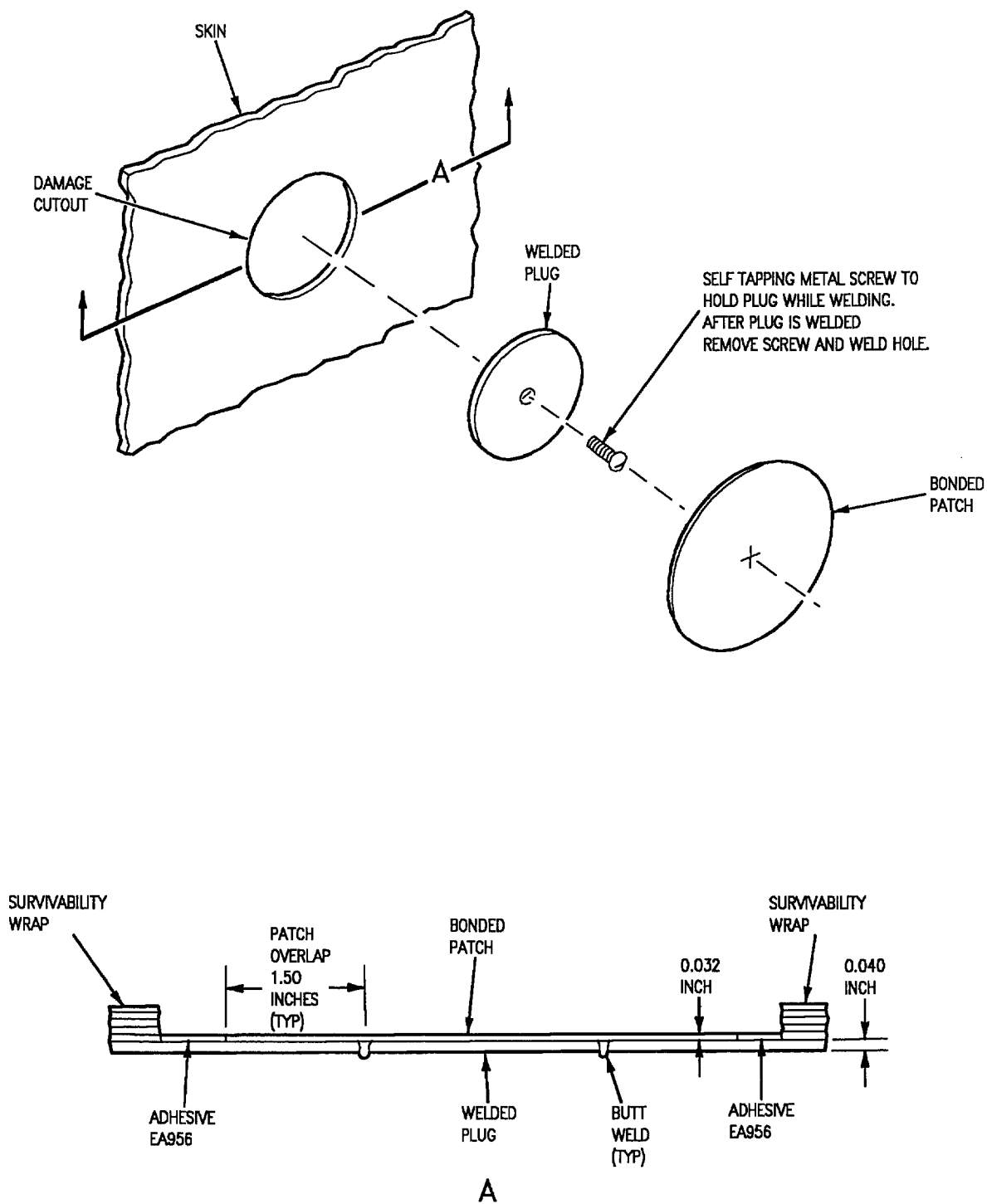


Figure 3. Repair Procedure Three (Sheet 1)

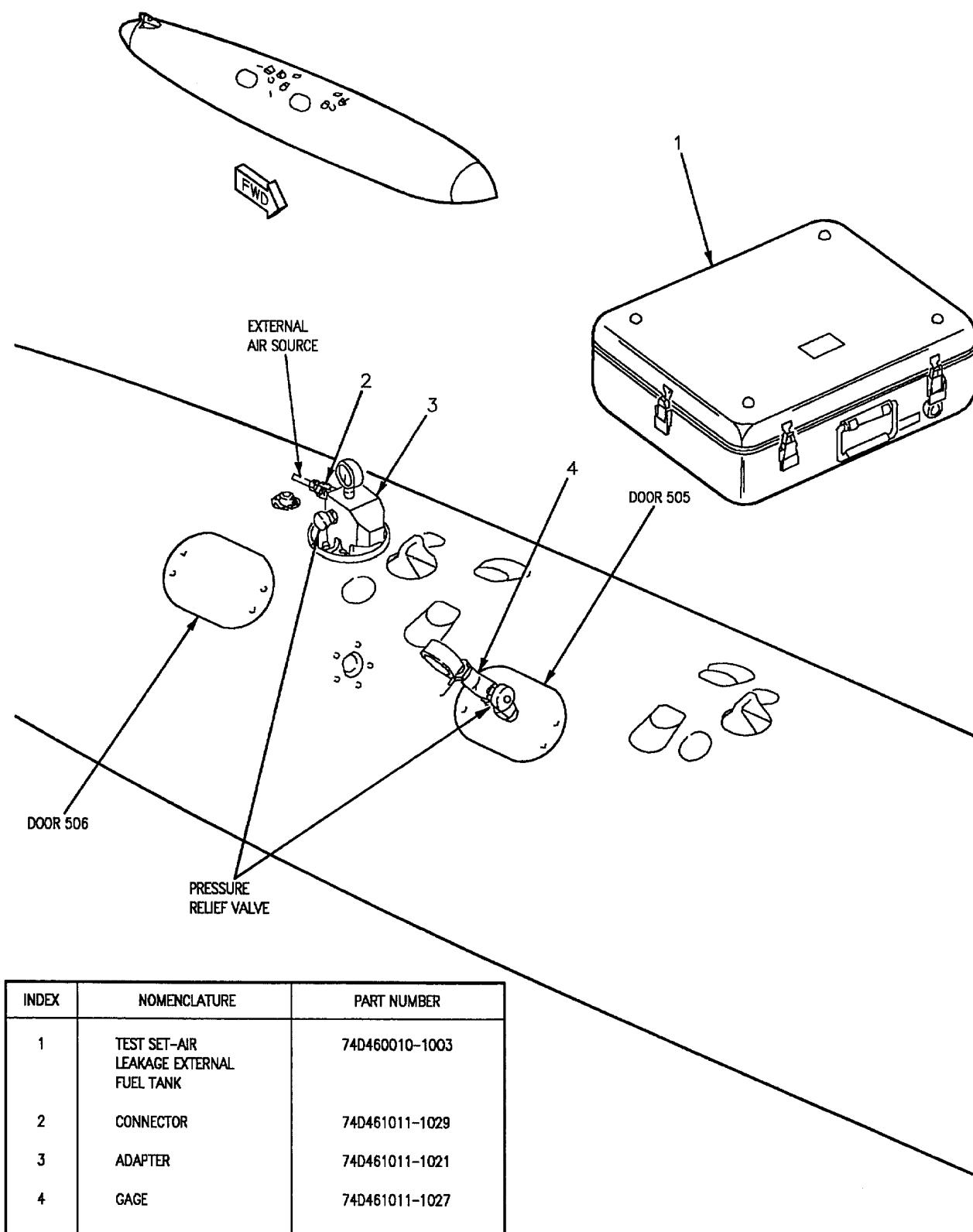




Figure 3. Repair Procedure Three (Sheet 2)

17. REPAIR PROCEDURE FOUR.

18. REMOVAL OF EXTERNAL FUEL TANK.

- a. Observe applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).
- b. Defuel external fuel tank (A1-F18AC-PCM-000).
- c. Drain residual fuel per substeps below:

(1) Position an approved safety container under external fuel tank drain valve.



Jet Fuel21

WARNING

To prevent personal injury, do not stand directly under drain valve.

(2) Open drain valve.

(3) Close drain valve when residual fuel has drained.

d. Remove external fuel tank (A1-F18AC-LWS-000).

e. Purge external fuel tank until a safe indication is displayed on the indicator, per Combustible and Toxic Gas Indicator, and Purging Procedures, this WP.

19. REPAIRS. See Figure 4.

Support Equipment Required

Nomenclature	Part Number or Type Designation
Test Set, Air Leakage, External Fuel Tank	74D460010

Materials Required

Nomenclature	Specification or Part Number
Adhesive	EA956
Aluminum Patch	18AC-SRM-A1 Fabricate (WP006 01)




Aluminum Sheets, 8 Inch by 8 Inch	6061-T6, 0.050 Inch Thick
Apron, Utility	MIL-A-41829
Blind Rivet	NAS1398C6A
Gloves, Chemical	ZZ-G-381, Type 1, Style 1
Isopropyl Alcohol	TT-I-735, Grade 1
Paper, Abrasive	A-A-1047, Grit 180
Rymple Cloth	AMS-3819
Sealing Compound	MIL-S-83430
Tape, Pressure Sensitive	855-1.000

WARNING

Flush and clean tank before repairing per purging procedures. Fuel presence while cutting out damage will cause fire and/or explosion.

a. Remove survivability wrap:

(1) Mask surface around damaged area with pressure sensitive tape.



Isopropyl Alcohol4

CAUTION

To avoid contamination, always pour isopropyl alcohol onto clean rymple cloth. Never dip rymple cloth into isopropyl alcohol.

(2) Wipe unmasked area with clean rymple cloth dampened with isopropyl alcohol.

NOTE

Remove material so that a 1-inch clearance exists between wrap and damage on all sides.

(3) Remove damaged material using a router bit, X-acto knife, and abrasive paper.

(4) Vacuum clean repair area.

WARNING

Before making repairs, make sure that the fuel/air concentration at several places inside the tank is less than 5 percent of the lower explosive limit. Fuel/air concentration above this limit could cause a fire and/or explosion.

b. Repair damage by an internal doubler patch.

c. Limit aluminum skin damage cutout per sub-steps below:

(1) Remove damage in an oval shape to allow doubler to be inserted into the tank.

(2) Length of cutout will equal the width plus 1.75 inches.

(3) Damage not to exceed 6.0 inches in length after cut out.

(4) Damage not to exceed 4.25 inches in width after cut out.

(5) Damage that is less than 0.50 inch in width is cutout to a minimum of 0.50 inch in width and 2.25 inch in length to allow for insertion of doubler.

d. Limit doubler to substeps below:

(1) Doubler material is 6061-T6 aluminum alloy, 0.050 inch thick and 1.50 inch larger in diameter than cutout.

(2) Doubler to be formed before fastening.

(3) Width of the doubler will not exceed length of cutout.

e. Locate rivet holes per substeps below:

(1) Mark a concentric oval that is a distance of 0.38 inch from cutout on all sides.

(2) On this concentric oval, mark center of a rivet hole at the center of each arc.

(3) Using holes marked in substep (2) for reference, mark additional rivet holes at evenly spaced intervals as close as possible to 0.75 inch apart until damage is completely surrounded.

f. Use blind rivets.



Sealing Compound

5

g. Coat rivets with MIL-S-83430 sealant, and install while sealant is wet (A1-F18AC-SRM-200, WP011 00).

h. Coat doubler with MIL-S-83430 sealant on the side that mates with external fuel tank skin before installation (A1-F18AC-SRM-200, WP011 00).

i. Seal fastener heads, damage hole, and doubler joint after repair is complete with MIL-S-83430 sealant (A1-F18AC-SRM-200, WP011 00).

j. Install doors 505 and 506 (A1-F18AC-LMM-010).

k. Leak test repairs, with the test set-air leakage, external fuel tank (1) per substeps below:

(1) Fill tank with water.

(2) Install adapter (3) on fuel/air coupling.

(3) Install connector (2) to adapter (3).

(4) Connect facility air to connector (2).

(5) Install gage (4) on tank.

(6) Turn on facility air and regulate air pressure to 15 psi. Inspect for leaks around repaired area.

(7) On completion of inspection, turn off facility air.

(8) Open pressure relief valve on adapter (3) and allow tank pressure to deplete.

(9) Disconnect facility air from connector (2) and remove adapter (3) and gage (4) from tank.

(10) Drain water from tank.

l. Remove doors 505 and 506 (A1-F18AC-LMM-010).

m. Install tank fuel system components (A1-F18AC-460-030, WP009 00).

(1) Pressure Relief Valve.

(2) Pressurization and Vent Valve.

(3) Fuel Quantity Transmitter.

(4) Manual Precheck Valve.

(5) Electrical Cable Assembly.

n. Install doors 505 and 506 (A1-F18AC-LMM-010).

o. Prepare EA956 adhesive (A1-F18AC-SRM-200, WP011 00).

p. Fill damage cut out and area between the wrap and patch until adhesive is flush with the top of fastener heads across complete repair area.



Adhesive

19

q. Cure EA956 adhesive (A1-F18AC-SRM-250, WP004 00).

r. Replace survivability wrap, per class VIII damage (WP024 02).

s. Refinish repaired areas (A1-F18AC-SRM-500, WP047 00).

20. INSTALLATION OF EXTERNAL FUEL TANK. Install external fuel tank (A1-F18AC-LWS-000).

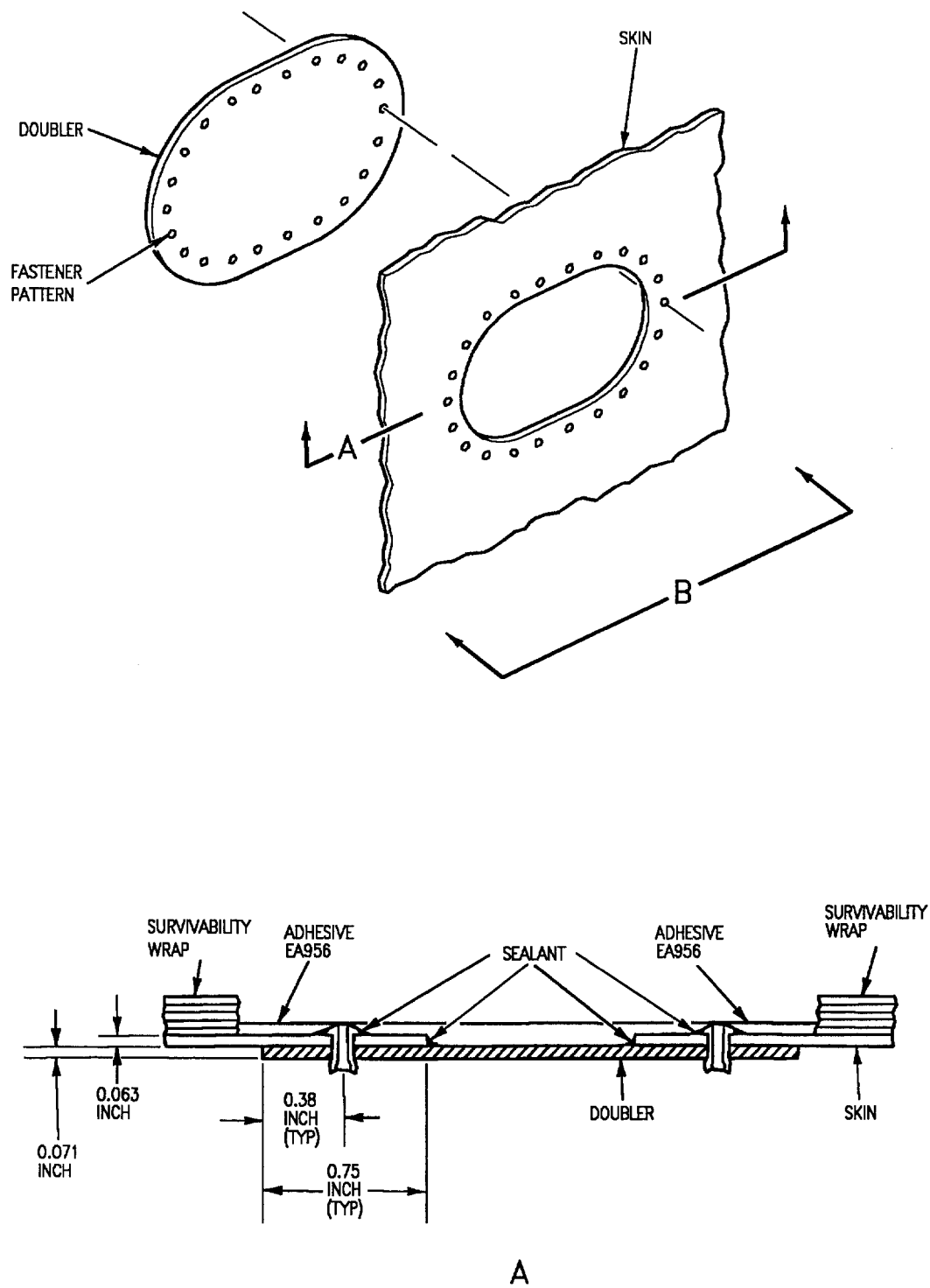
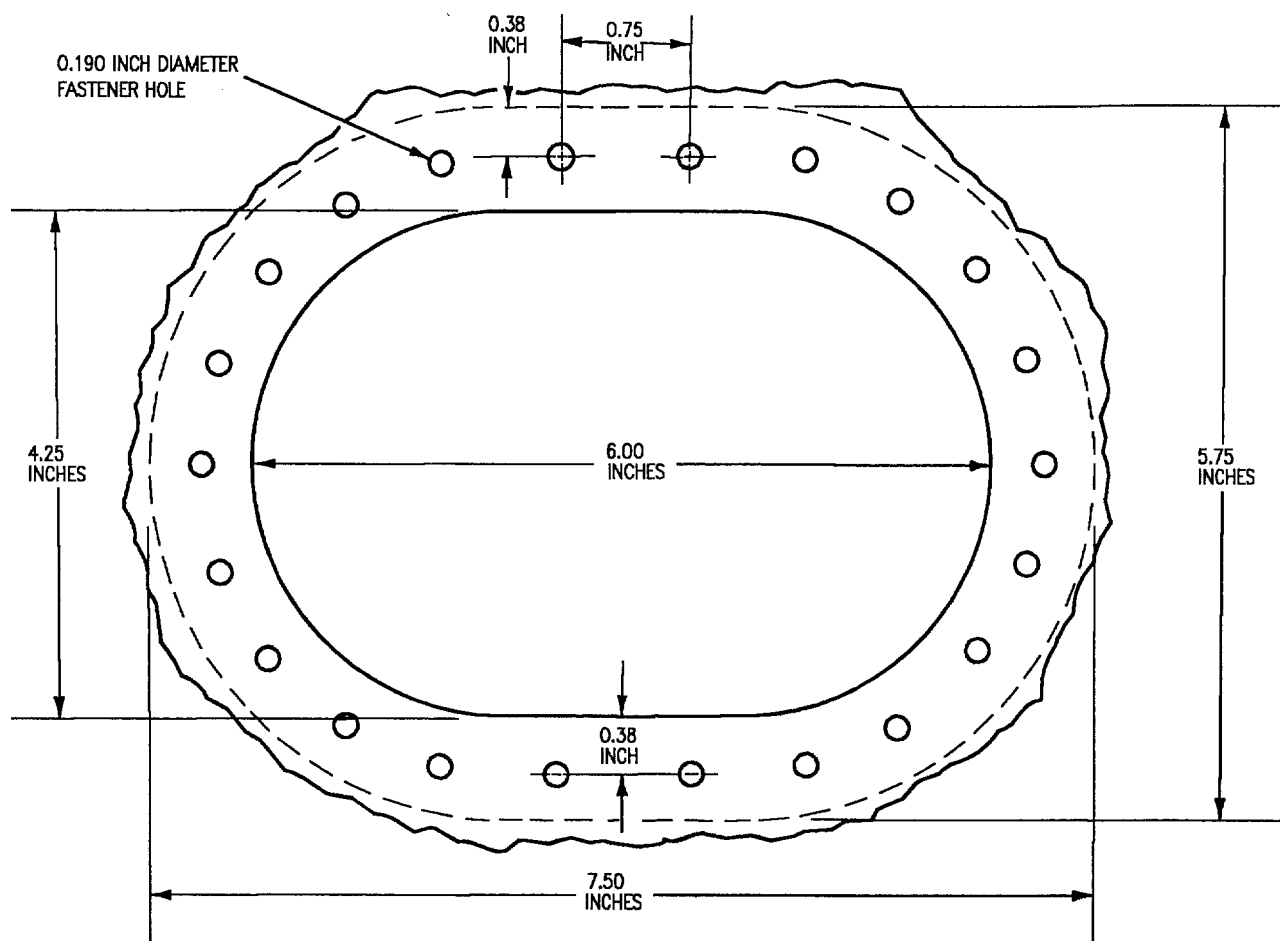
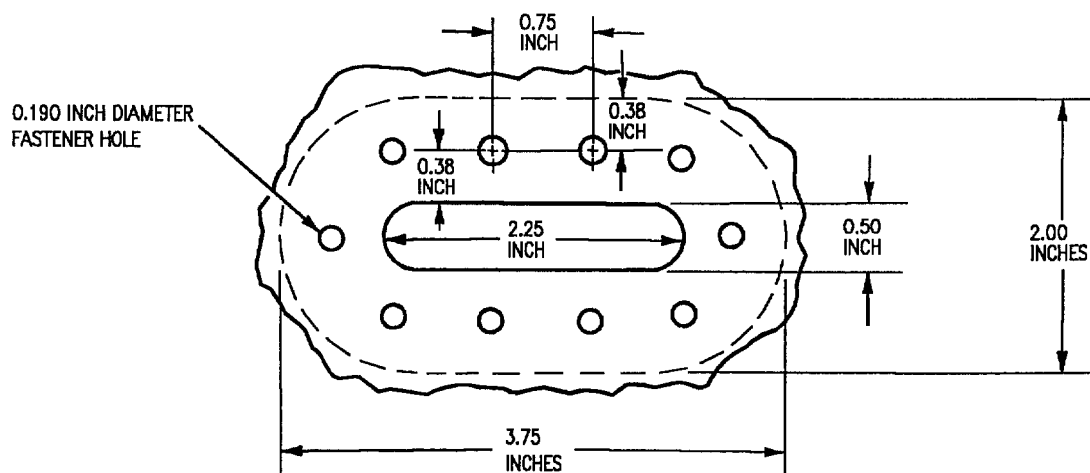


Figure 4. Repair Procedure Four (Sheet 1)



DOUBLER/MAXIMUM



DOUBLER/MINIMUM

B

Figure 4. Repair Procedure Four (Sheet 2)

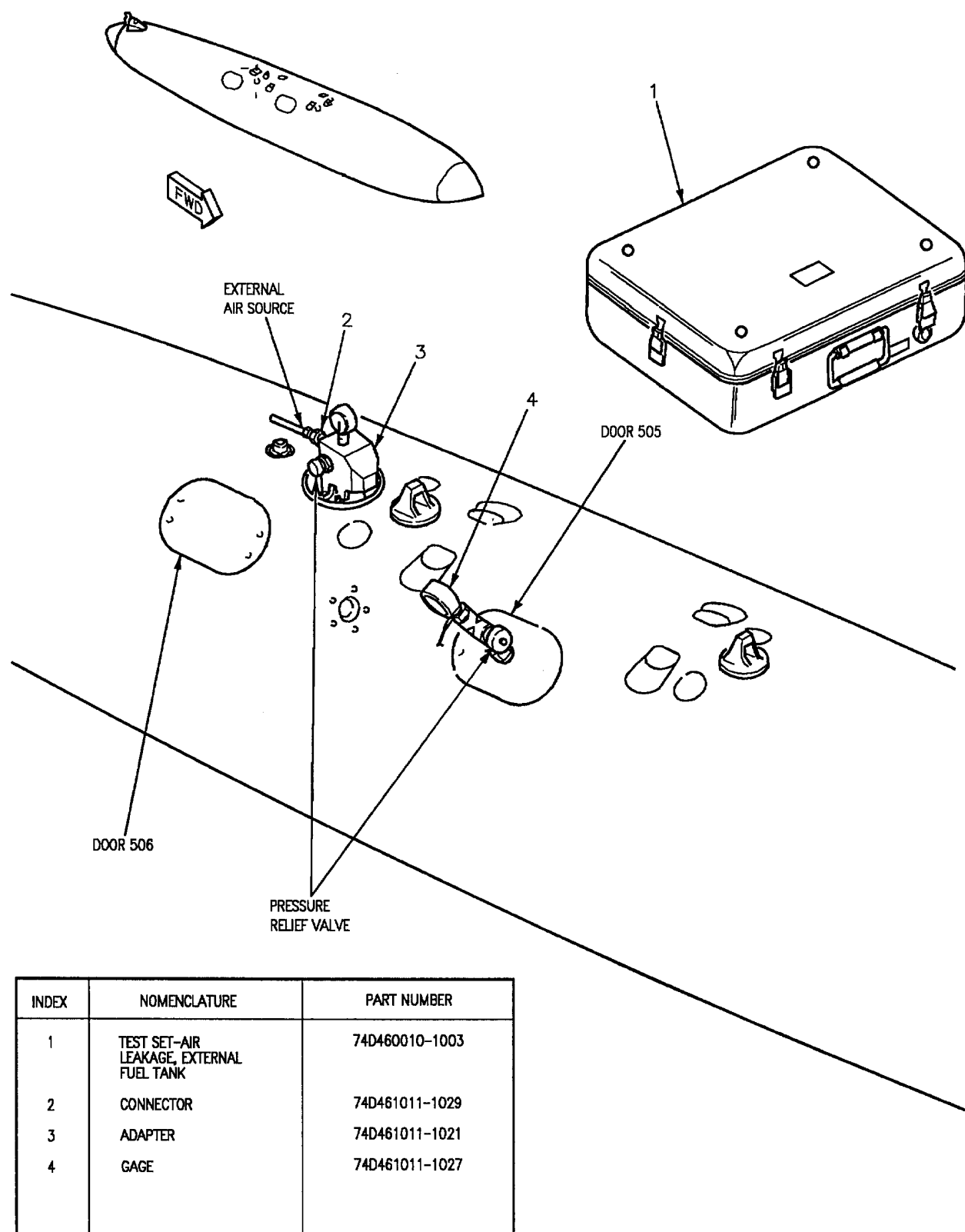


Figure 4. Repair Procedure Four (Sheet 3)

DEPOT MAINTENANCE

STRUCTURE REPAIR

INNER WING REMOVAL AND INSTALLATION

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Trailing Edge Flap Shroud	WP007 00
Outer Wing Removal and Installation	WP020 00
Strain Gages	WP023 00
Inner Wing Replacement	WP025 01
Fuel System	A1-F18AC-460-300
Ground Support Equipment	WP009 01
Fuel Tank Maintenance Precautions and General Preparation	WP013 00
Integrated Flight Controls	A1-F18AC-570-300
Inboard Flap (84MPU535 or 84MPV536)	WP028 00
Inner Wing Inboard Flap Mechanism Electronic Flight Control System	WP029 00
Leading Edge Flap Drive Unit and Servo Valve (84A-M021) - 161353 THRU 161519	WP035 00
Leading Edge Flap Servo Valve and Drive Unit (84A-M021) - 161520 AND UP	WP036 01
Trailing Edge Flap (84MP053U or 84MPV540)	WP039 00
Trailing Edge Flap Servocylinder (84A-V013 or 84A-V014)	WP040 00
Line Maintenance Access Doors	A1-F18AC-LMM-010
Line Maintenance Procedures	A1-F18AC-LMM-000
Plane Captain Manual	A1-F18AC-PCM-000
Structure Repair, Center Fuselage	A1-F18AC-SRM-230
Aft Center Fuselage Bulkheads and Formers	WP016 00
Structure Repair, General Information	A1-F18AC-SRM-200
Fasteners	WP004 06
Adhesive, Cement and Sealant; Preparation and Application	WP011 00
Aircraft Fuel Cells and Internal/External Tanks	NAVAIR 01-1A-35

Alphabetical Index

Subject	Page No.
Installation	5
Removal	2

Record of Applicable Technical Directives

None

Support Equipment Required

Nomenclature	Part Number or Type Designation
Adapter, Inner Wing Removal/Installation	74D110302
Air Logistics Stand	3000A
Air Logistics Trailer	4000A or PDG7558
Exhaust Blower	MA-1
Inner Wing Multiple Leg Sling	74D110301
Installation Kit, Wing Attach Fittings	74D110321
Thickness Gage	-
Tripod Jack	270AS100
Tripod Jack, 20 Ton (T20-3FH)	782D1100
Torque Wrench, 0 to 200 Inch-Pounds	-
Torque Wrench, 0 to 600 Inch-Pounds	-

Materials Required

Nomenclature	Specification or Part Number
Cotter Pin	MS24665-153
Grease, Aircraft	MIL-G-81322
Isopropyl Alcohol	TT-I-735, Grade 1
Petrolatum, Technical	VV-P-236
Rymple Cloth	AMS-3819
Sealing Compound	MIL-S-83430

1. REMOVAL.

2. These procedures are for the existing left inner wing (wing). Procedures for the right inner wing are identical except as indicated.

a. Make sure safety devices required for ground operations are installed (A1-F18AC-PCM-000).

b. Comply with applicable fuel tank maintenance precautions (A1-F18AC-460-300, WP013 00).

c. Defuel aircraft (A1-F18AC-PCM-000).

d. Drain residual fuel by positioning an approved safety container under wing fuel drain valve.



Jet Fuel



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WARNING

To prevent personal injury, do not stand directly under drain valve.

e. Open drain valve (A1-F18AC-LMM-000).

f. Close drain valve (A1-F18AC-LMM-000).

g. Ground exhaust blower to approved static ground.

h. Remove doors 76L (or 76R) and 77L (or 77R) (A1-F18AC-LMM-010).

i. Purge wing fuel tank with exhaust blower until a safe indication is displayed on the combustible and toxic gas indicator (A1-F18AC-460-300, WP009 01). For purging (NAVAIR 01-1A-35).

j. Stabilize aircraft with two tripod aircraft jacks, do not raise aircraft, figure 1 view K.

CAUTION

Use care to not damage match angle when removing from structure.

k. Remove match angle by removing screws (53, figure 2) and bolts (51 and 52) and attaching hardware, view R.

l. Remove access doors 19L (or 19R), 78L (or 78R), 79L (or 79R), 107L (or 107R), 32L (or 32R), 34L (or 34R), 113L (or 113R), 41L (or 41R), 20L (or 20R), 21L (or 21R) and 193L (or 193R) (A1-F18AC-LMM-010).

m. Remove trailing edge flap shroud (WP007 00).

n. Remove trailing edge flap (A1-F18AC-570-300, WP039 00).

o. Remove trailing edge flap servocylinder (A1-F18AC-570-300, WP040 00).

p. Remove outer wing (WP020 00).

q. Remove inboard leading edge flap (A1-F18AC-570-300, WP028 00).

r. For 161353 THRU 161519, remove leading edge flap drive unit and servo valve (A1-F18AC-570-300, WP035 00).

s. For 161520 AND UP, remove leading edge flap drive unit and servo valve (A1-F18AC-570-300, WP036 01).

t. For right wing, remove outboard angle drive unit (A1-F18AC-570-300, WP029 00).

u. For right wing, remove bolt (13) and attaching hardware from shaft (14) and remove shaft from angle drive unit, view F.

v. Disconnect cable (9) from wing lock control (12), remove clamp (8), remove cable from center fuselage, roll up cable and stow on wing front spar, views C, D, and E.

w. For right wing, disconnect cable (11) from wing lock control (12), remove clamp (10), remove from center fuselage, roll up cable and stow on wing front spar, views C and E.

x. Disconnect electrical connectors (18, 19, 22, 23, 24, 25, 26, 27, 28, 29, 30, and 31), remove clamps (20 and 21) and pull electrical cable assemblies into center fuselage, views H, J and K.



Titanium alloy tubes will break if flexed excessively or twisted during removal.

y. Disconnect hydraulic tube assemblies (33 and 34) at both ends, remove clamp (32) and remove from aircraft, view L.

NOTE

Place tags on individual tube assemblies, both fuselage and wing, indicating pressure or return, and their respective wing bulkhead mount holes.

z. Disconnect lower hydraulic tube assemblies (35 and 36) at outboard end from elbows (37 and 38), disconnect upper hydraulic tube assemblies (39 and 42) at inboard end, remove jam nuts (40 and 41) from bulkhead fittings at inner wing closure rib, view M.

aa. Disconnect fuel lines (43, 44, 45, 46, 47, 48, 49, and 50) at inner wing closure rib, view P.

ab. Position hoist and attach sling (1, figure 1) to adapter (2), view A.

ac. Hoist and mount adapter (2) to trailer (3), view G for 4000A trailer, or views H and J for PDG7558 trailer. Remove sling (1) from adapter (2), view A.

ad. Lock brake assemblies of adapter (2) on rails of trailer (3), view G for 4000A trailer, and view J for PDG7558 trailer.

ae. Make sure that the adapter (2) is rigged to the correct configuration for wing to be removed, view A.

af. Remove screws (9) from wing pylon aft inner fitting (10) and remove fitting, view D.

ag. Position trailer (3) and adapter (2) under wing to be removed.



Be sure inner wing jack point locator (12) and inboard forward pylon attach point locator (4) are adjusted down before attaching adapter (2) to wing to prevent damage to wing or adapter.

ah. Raise and align trailer (3) and adapter (2) with correct mating points.

(1) Install and adjust inner wing jack point locator (12), view E.

(2) Insert inboard forward pylon attach point locator (4) into hole in lower wing surface and install retaining pin (5), view C.

ai. Lock brakes on trailer (3), view B.

aj. Attach outboard forward pylon clamp assembly (13) to wing and adapter (2) with retaining pin (15), view F.

ak. Attach inboard aft pylon attach point locator (6) with captive screws (7) to wing, view D.

al. Tighten hand knobs to secure wing to adapter (2), views D, E, and F.

am. Remove centerpoint bolt (4, figure 2) and attaching hardware from forward shear tie link (7). Remove bolts (5 and 6) and attaching hardware from wing and forward shear tie link (7) and remove forward shear tie link, view A.

an. Remove bolt (3) and attaching hardware from outboard end of upper closure former (1). Remove two

Hi-Lok rivets (2), (A1-F18AC-SRM-200, WP004 06), from inboard end of closure former (1) and remove former, view A.

ao. Locate strain gages (WP023 00).



Be careful when disconnecting strain gage wires to avoid damage to strain gages or wire bundle splice.

NOTE

Do not remove strain gage from wing structure. Disconnect wires only.

(1) Remove ground wire.

(2) Disconnect strain gage at wire bundle.

ap. Remove bolts (17) and attaching hardware. Remove Hi-Lok rivets (16) (A1-F18AC-SRM-200, WP004 06) and attaching hardware. Remove aft shear tie bearing (15), slider blocks (54), retainers (55) and shims (56) from aft shear tie fitting on fuselage, view D.

aq. Remove six bolts (17, figure 3) and attaching hardware from the six wing attach pins (11, 12, 13, 14, 15, and 16) views A and B.



If excessive force is required to remove attach pins, adjust trailer and adapter and make sure the correct guide pin and alignment pin is being used with the correct hole, to prevent damage to pins or holes.

To prevent damage to pins during removal, tap lightly with a plastic mallet.

NOTE

Tag all attach pins (11, 12, 13, 14, 15, and 16) with fuselage station and upper/lower hole location information when removed to make sure that same attach pin is reinstalled into same hole. Attach pins shall not be interchanged between aircraft.

ar. Remove attach pin (11) by displacing with guide pin (2) lower hole, fuselage station Y470.500, view B.

as. Remove guide pin (2) by displacing with alignment pin (9) lower hole, fuselage station Y470.500, view C.

at. Remove attach pin (13) by displacing with guide pin (7) lower hole, fuselage station Y453.000, view B.

au. Remove guide pin (7) by displacing with alignment pin (8) lower hole, fuselage station Y453.000, view C.

av. Remove attach pin (15) in forward direction by displacing with guidepin (1) lower hole, fuselage station Y488.000, view B.

aw. Remove guide pin (1) in forward direction by displacing with alignment pin (10) lower hole, fuselage station Y488.000, view C.

ax. Remove attach pin (12) by displacing with guide pin (6) upper hole, fuselage station Y470.500, view B.

ay. Remove guide pin (6) by displacing with alignment pin (4) upper hole, fuselage station Y470.000, view C.

az. Remove attach pin (14) by displacing with guide pin (6) upper hole, fuselage station Y453.000, view B.

ba. Remove guide pin (6) by displacing with alignment pin (3) upper hole, fuselage station Y453.000, view C.

bb. Remove attach pin (16) by displacing with guide pin (6) upper hole, fuselage station Y488.000, view B.

bc. Remove guide pin (6) by displacing with alignment pin (5) upper hole, fuselage station Y488.000, view C.

bd. Remove the alignment pins (3, 4, 5, 8, 9, and 10), view D, by lightly tapping with a plastic mallet in the sequence listed below:

- (1) Lower hole, fuselage station Y470.500.
- (2) Lower hole, fuselage station Y453.000.
- (3) Lower hole, fuselage station Y488.000, in forward direction.
- (4) Upper hole, fuselage station Y470.500.
- (5) Upper hole, fuselage station Y453.000.
- (6) Upper hole, fuselage station Y488.000.

be. Remove all shims from lugs using a feeler gage, figure 3 view D.



Inspect wing to fuselage attach areas to make sure all mechanical, electrical, hydraulic and fuel disconnections are clear for wing removal.

Trailer must be 90 degrees from aircraft centerline so there will be no damage at lugs and aft shear tie attachment.

bf. Release brakes on trailer (3, figure 1) remove wing from fuselage.

bg. When wing is clear of fuselage, lower trailer (3) and lock brakes on trailer (3), view B.

bh. After wing removal, inspect center fuselage wing attach point bulkheads per Damage Evaluation (A1-F18AC-SRM-230, WP016 00).

bi. Locally fabricate protective devices for wing and center fuselage attach points.

3. INSTALLATION.



Make sure any required center fuselage wing attach point repairs have been completed, before wing installation, to avoid damage to aircraft (A1-F18AC-SRM-230, WP016 00).

4. These procedures are for the existing left inner wing or for a replacement wing (wing). Procedures for right wing are identical except as indicated.



Do not hoist wing and adapter (2, figure 1) together, could cause damage to sling (1).

a. Position hoist and attach sling (1, figure 1) to adapter (2), view A.

b. Hoist and mount adapter (2) to trailer (3), view G for 4000A trailer, or views H and J for PDG7558 trailer. Remove sling (1) from adapter (2), view A.

c. Lock brake assemblies of adapter (2) on rails of trailer (3), view G for 4000A trailer, and view J for PDG7558 trailer.

d. Make sure that adapter (2) is rigged to the correct configuration for wing to be installed, view A.

NOTE

Before placing wing on trailer (3) make sure brakes on trailer are locked, view B.

e. Buildup replacement wing (WP025 01).

f. Make sure access doors 76L (or 76R), 77L (or 77R), 19L (or 19R), 78L (or 78R), 79L (or 79R), 107L (or 107R), 32L (or 32R), 34L (or 34R), 113L (or 113R), 41L (or 41R), 20L (or 20R), 21L (or 21R) and 193L (or 193R) are removed (A1-F18AC-LMM-010).

g. Remove screws (9) from wing pylon aft inner fitting (10) and remove fitting, view D.

h. Attach sling (1) to wing, view L.

i. Lift wing with overhead hoist and position over adapter (2) and trailer (3).



Be sure inner wing jack point locator (12) and inboard forward pylon attach point locator (4) are adjusted down before attaching adapter (2) to wing to prevent damage to wing or adapter.

j. Lower and align wing with correct mating points.

(1) Install and adjust inner wing jack point locator (12), view E.

(2) Insert inboard forward pylon attach point locator (4) into hole in lower wing surface and install retaining pin (5), view C.

k. Attach outboard forward pylon clamp assembly (13) to wing and adapter (2) with retaining pin (15), view F.

l. Attach inboard aft pylon attach point locator (6) with captive screws (7) to wing, view D.

m. Tighten hand knobs (8, 11 and 14) to secure wing to adapter (2), views D, E, and F.

n. Remove sling (1) from wing, view L.



Inspect wing to fuselage attach areas to make sure all mechanical, electrical, hydraulic and fuel disconnections are clear for wing installation.

Trailer must be 90 degrees from aircraft centerline so there will be no damage to attach lugs and aft shear tie attachment.

Make sure fuselage and wing structural overlapping parts are aligned correctly before moving wing completely into fuselage to prevent damage to structure.

Use care when attaching wing to fuselage to avoid damage to wing or center fuselage structure.



Grease, Aircraft

15

o. Coat all lug holes with a light coating of grease.

p. Raise trailer (3), release brakes and move wing slowly into center fuselage until holes of attach lugs on wing align with holes of attach lugs on center fuselage.



If excessive force is required to install attach pins, adjust trailer and adapter and make sure the correct alignment pin and guide pin is being used with the correct hole, to prevent damage to pins or holes.

To prevent damage to pins during installation, tap lightly with a plastic mallet.

q. Coat all alignment pins (3, 4, 5, 8, 9, and 10, figure 3) with a light coating of grease, view D.

r. Install alignment pins in sequence listed below, view C:

(1) Alignment pin (4) in upper hole, fuselage station Y470.500.

(2) Alignment pin (3) in upper hole, fuselage station Y453.000.

(3) Alignment pin (5) in upper hole, fuselage station Y488.000.

(4) Alignment pin (9) in lower hole, fuselage station Y470.500.

(5) Alignment pin (8) in lower hole, fuselage station Y453.000.

(6) Alignment pin (10) in lower hole, fuselage station Y488.000.

s. Coat thickness gages and shims with grease and wipe off excess grease.

NOTE

If 0.040 inch gap is not possible, align fuselage lugs at Y470.500 equally between lower forward wing lug and upper aft wing lug.

t. Insert 0.040 inch thickness gage at fuselage station Y470.500 lower lugs between fuselage lug and

wing aft lug, and wedge a tapered thickness gage between fuselage lug and wing forward lug to maintain 0.040 gap at aft lug. (QA)

u. Coat all guide pins (1, 2, 6, and 7) and attach pins (11, 12, 13, 14, 15, and 16) with a light coating of grease before installing into lugs.

v. Install shims on both sides of fuselage lugs as required to get a maximum unshimmed gap of 0.100, with a minimum gap of 0.005 between fuselage and wing lugs, and install guide pins and attach pins in sequence listed below, views D, C, B, and A: (QA)

(1) Remove alignment pin (3) in upper hole, fuselage station Y453.000, install shims as required, and reinstall alignment pin (3).

(a) Displace alignment pin (3) with guide pin (6).

(b) Displace guide pin (6) with attach pin (14).



Isopropyl Alcohol



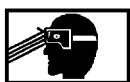
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(c) Wipe cap and wing lug with clean rymple cloth moistened with isopropyl alcohol until no sign of residue remains on rymple cloth.

(d) Dry cap and wing lug with clean dry rymple cloth.



Technical Petrolatum



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(e) Apply a thin film of petrolatum to mating surfaces of cap and wing lug using rymple cloth.



Sealing Compound



5

(f) Fay seal washers with sealing compound (A1-F18AC-SRM-200, WP011 00).

(g) Install attach bolt and hardware (17) and torque 60 to 85 inch-pounds. Install cotter pin. (QA)

(h) Smooth sealant squeeze-out from washers and fillet seal bolt head and nut with sealing compound (A1-F18AC-SRM-200, WP011 00).

(2) Remove alignment pin (5) in upper hole, fuselage station Y488.000 install shims as required, and reinstall alignment pin (5).

(a) Displace alignment pin (5) with guide pin (6).

(b) Displace guide pin (6) with attach pin (16).

(c) Wipe cap and wing lug with clean rymple cloth moistened with solvent until no sign of residue remains on rymple cloth.

(d) Dry cap and wing lug with clean dry rymple cloth.

(e) Apply a thin film of petrolatum to mating surfaces of cap and wing lug using rymple cloth.

(f) Fay seal washers with sealing compound (A1-F18AC-SRM-200, WP011 00).

(g) Install attach bolt and hardware (17) and torque 60 to 85 inch-pounds. Install cotter pin. (QA)

(h) Smooth sealant squeeze-out from washers and fillet seal bolt head and nut with sealing compound (A1-F18AC-SRM-200, WP011 00).

(3) Remove alignment pin (4) in upper hole, fuselage station Y470.500, install shims as required, and reinstall alignment pin (4).

(a) Displace alignment pin (4) with guide pin (6).

(b) Displace guide pin (6) with attach pin (12).

(c) Wipe cap and wing lug with clean rymple cloth moistened with isopropyl alcohol until no sign of residue remains on rymple cloth.

(d) Dry cap and wing lug with clean dry rymple cloth.

(e) Apply a thin film of petrolatum to mating surfaces of cap and wing lug using rymple cloth.

(f) Fay seal washers with sealing compound (A1-F18AC-SRM-200, WP011 00).

(g) Install attach bolt and hardware (17) and torque 60 to 85 inch-pounds. Install cotter pin. (QA)

(h) Smooth sealant squeeze-out from washers and fillet seal bolt head and nut with sealing compound (A1-F18AC-SRM-200, WP011 00).

(4) Remove alignment pin (9) in lower hole, fuselage station Y470.500, install shims as required, and reinstall alignment pin (9).

(a) Displace alignment pin (9) with guide pin (2).

(b) Displace guide pin (2) with attach pin (11).

(c) Wipe cap and wing lug with clean rymple cloth moistened with isopropyl alcohol until no sign of residue remains on rymple cloth.

(d) Dry cap and wing lug with clean dry rymple cloth.

(e) Apply a thin film of petrolatum to mating surfaces of cap and wing lug using rymple cloth.

(f) Fay seal washers with sealing compound (A1-F18AC-SRM-200, WP011 00).

(g) Install attach bolt and hardware (17) and torque 60 to 85 inch-pounds. Install cotter pin. (QA)

(h) Smooth sealant squeeze-out from washers and fillet seal bolt head and nut with sealing compound (A1-F18AC-SRM-200, WP011 00).

(5) Remove alignment pin (8) in lower hole, fuselage station Y453.000 install shims as required and reinstall alignment pin (8).

(a) Displace alignment pin (8) with guide pin (7).

(b) Displace guide pin (7) with attach pin (13).

(c) Wipe cap and wing lug with clean rymple cloth moistened with isopropyl alcohol until no sign of residue remains on rymple cloth.

(d) Dry cap and wing lug with clean dry rymple cloth.

(e) Apply a thin film of petrolatum to mating surfaces of cap and wing lug using rymple cloth.

(f) Fay seal washers with sealing compound (A1-F18AC-SRM-200, WP011 00).

(g) Install attach bolt and hardware (17) and torque 60 to 85 inch-pounds. Install cotter pin. (QA)

(h) Smooth sealant squeeze-out from washers and fillet seal bolt head and nut with sealing compound (A1-F18AC-SRM-200, WP011 00).

NOTE

All pins for lower lug at fuselage station Y448.000 shall be installed from the forward direction.

(6) Remove alignment pin (10) in lower hole, fuselage station Y488.000, install shims as required, and reinstall alignment pin (10).

(a) Displace alignment pin (10) with guide pin (1).

(b) Displace guide pin (1) with attach pin (15).

(c) Wipe cap and wing lug with clean rymple cloth moistened with isopropyl alcohol until no sign of residue remains on rymple cloth.

(d) Dry cap and wing lug with clean dry rymple cloth.

(e) Apply a thin film of petrolatum to mating surfaces of cap and wing lug using rymple cloth.

(f) Fay seal washers with sealing compound (A1-F18AC-SRM-200, WP011 00).

(g) Install attach bolt and hardware (17) and torque 60 to 85 inch-pounds. Install cotter pin. (QA)

(h) Smooth sealing compound squeeze-out from washers and fillet seal bolt head and nut with sealing compound (A1-F18AC-SRM-200, WP011 00).

w. Connect strain gages (WP023 00).



Be careful when connecting strain gages to avoid damage to strain gages or wire bundle splice.

NOTE

Connect existing strain gages. Do not install new ones unless required.

(1) Connect strain gage at wire bundle.

(2) Install ground wire.

x. Coat wing aft shear tie fitting with a light coating of grease, figure 2, view D.

y. Install aft shear tie bearing (15) on fuselage aft shear tie fitting, view D.

(1) Install slider blocks (54) and retainers (55).

(2) Shim as required on both sides of the bearing, using a maximum of two shims, one of which may be laminated. Limit laminated shim thickness to 0.062 maximum. The maximum unshimmed gap is 0.005.

(3) Fay seal between the shims and the retainer with sealing compound (A1-F18AC-SRM-200, WP011 00).

(4) Install bolts (17) and attaching hardware. Torque bolts 100 to 140 inch-pounds and install cotter pins.

(5) Install Hi-Lok rivets (16) (A1-F18AC-SRM-200, WP004 06) and attaching hardware, view D. (QA)

z. Install upper closure former (1) with bolt (3) and attaching hardware in outboard end of upper closure former (1) and install two Hi-Lok rivets (2) (A1-F18AC-SRM-200, WP004 06) in inboard end of upper closure former (1), view A.

aa. Install forward shear tie link (7) with bolt (5) and 6) and attaching hardware to wing. Torque bolt (6) 100 to 140 inch-pounds and install cotter pin, bolt (4), and attaching hardware. Torque 60 to 85 inch-pounds and install cotter pin, view A. (QA)

ab. Loosen hand knobs (8, 11, and 14, figure 1, views D, E, and F).

ac. Remove captive screws (7) and inboard aft pylon attach point locator (6) from wing, view D.

ad. Remove retaining pin (15) from adapter (2) and remove outboard forward pylon clamp assembly (13) from wing, view F.

ae. Remove retaining pin (5) from adapter (2) and remove inboard forward pylon attach point locator from wing, view E.

af. Lower adapter (2) and trailer (3) slowly disconnecting adapter from wing.

ag. Unlock brakes on trailer (3) and remove from under wing.

ah. Connect fuel lines (43, 44, 45, 46, 47, 48, 49, and 50) figure 2, view J at inner wing closure rib.



Titanium alloy tubes will break if flexed excessively or twisted during installation.

Make sure that fuselage to wing hydraulic lines are installed in their correct mount holes.

ai. Connect lower hydraulic tube assemblies (35 and 36) at outboard end to elbows (37 and 38). Install jam nuts (40 and 41) on bulkhead fittings at inner wing closure rib, view H.

aj. Connect hydraulic tube assembly (39) to return line, view H.

ak. Connect hydraulic tube assembly (42) to pressure line, view H.

al. Remove any tags placed on tube assemblies or mount holes.

am. Install hydraulic tube assemblies (33 and 34), connect at both ends and install clamp (32), view G.

an. Route electrical cable assemblies into wing, install electrical connectors (18, 19, 22, 23, 24, 25, 26, 27, 28, 29, 30, and 31) and clamps (20 and 21), view E and F.

ao. Remove cable (9) from wing front spar, unroll and route into center fuselage. Connect cable (9) to wing lock control (12), install clamp (8), views B and C. (QA)

ap. For right wing, remove cable (11) from wing front spar and unroll and route into center fuselage. Connect cable (11) to wing lock control (12) and install clamp (10), view C. (QA)

aq. For 161353 THRU 161519, install leading edge flap drive unit and servo valve (A1-F18AC-570-300, WP035 00).

ar. For 161520 AND UP, install leading edge flap drive unit and servo valve (A1-F18AC-570-300, WP036 01).

as. For right wing, install outboard angle drive unit (A1-F18AC-570-300, WP029 00).

at. For right wing, install shaft (14) on angle drive unit. Install bolt (13) and attaching hardware on shaft (14) to provide a 0.000 to 0.010 inch maximum end play on bolt (13), view C. (QA)

au. Install inboard leading edge flap (A1-F18AC-570-300, WP028 00).

av. Install outer wing (WP020 00).

aw. Install trailing edge flap servocylinder (A1-F18AC-570-300, WP040 00).

ax. Install trailing edge flap (A1-F18AC-570-300, WP039 00).

ay. Install trailing edge flap shroud (WP007 00).

az. Remove two tripod aircraft jacks, (figure 1, view K).

ba. Install access doors 76L (or 76R) and 77L (or 77R) (A1-F18AC-LMM-010).

bb. Refuel aircraft (A1-F18AC-PCM-000) and check for leaks.

bc. Apply electrical power (A1-F18AC-LMM-000) and check all applicable systems.

bd. Apply hydraulic power (A1-F18AC-LMM-000) and check for leaks.

be. For 161353 THRU 161715, install match angle views R, S, T, and U.

(1) Apply petrolatum to mating surfaces of match angle and fuselage.

(2) Fay surface seal with sealing compound, (A1-F18AC-SRM-200, WP011 00).

(3) Install screws (53), bolts (51 and 52) and attaching hardware. Install fasteners wet with sealant (A1-F18AC-SRM-200, WP011 00).

bf. For 161716 AND UP, install match angle views K, L, and M.

(1) Apply petrolatum to mating surfaces of match angle and fuselage.

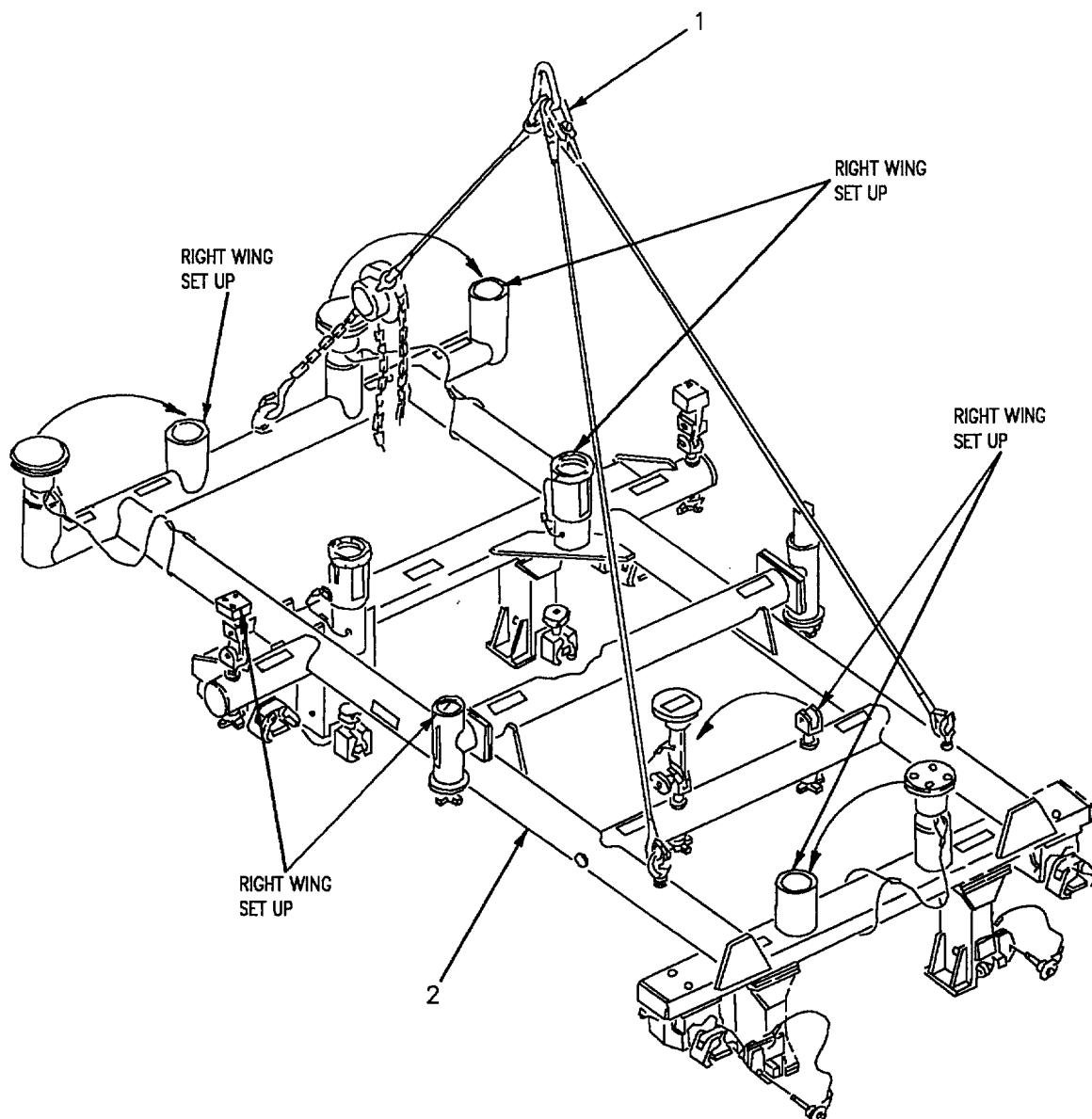
(2) Fay surface seal with sealing compound, (A1-F18AC-SRM-200, WP011 00).

(3) Install screws (53), bolts (51 and 52) and attaching hardware. Install fasteners wet with sealant (A1-F18AC-SRM-200, WP011 00).

(4) Torque nuts on bolts (51) 450 to 500 inch-pounds, torque nuts on bolts (52) 160 to 190 inch-pounds.

(5) Inspect forward and aft mating points of wing splice fitting and match angle for 0.040 inch gap, views R, S, T, and U.

bg. Install access doors 19L (or 19R), 78L (or 78R), 79L (or 79R), 107L (or 107R), 32L (or 32R), 34L (or 34R), 113L (or 113R), 41L (or 41R), 20L (or 20R), 21L (or 21R), and 193L (or 193R) (A1-F18AC-LMM-010).



A

LOCATING DETAILS SHOWN SET FOR LEFT
INNER WING REMOVAL AND INSTALLATION

Figure 1. Inner Wing Removal and Installation Adapter (Sheet 1)

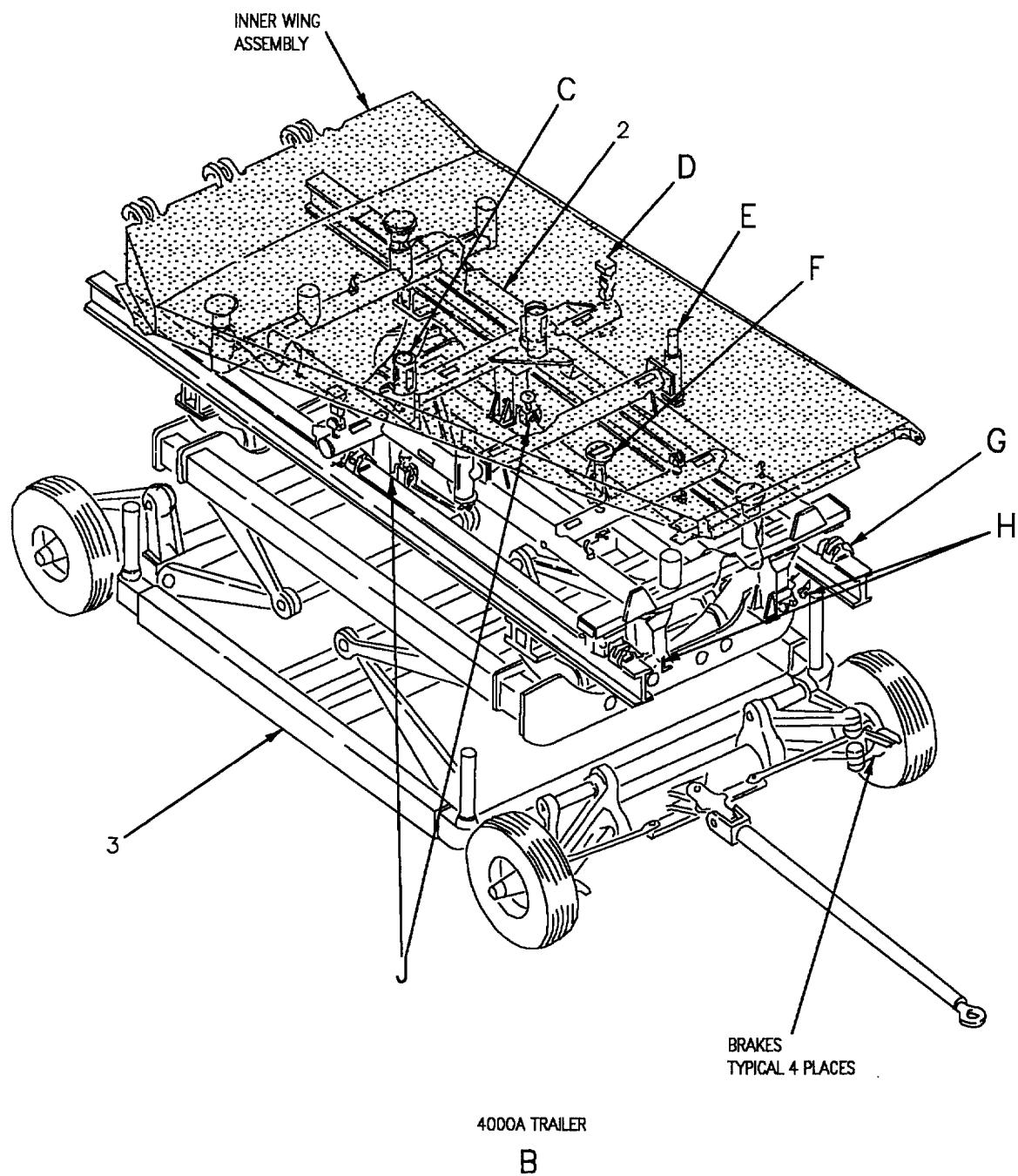
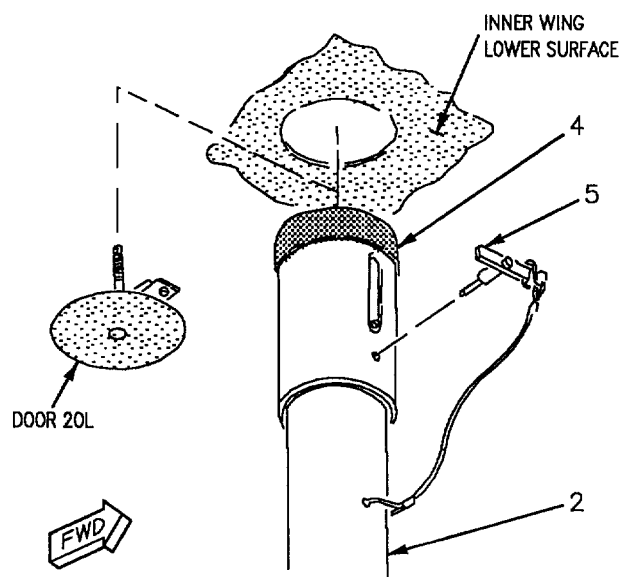
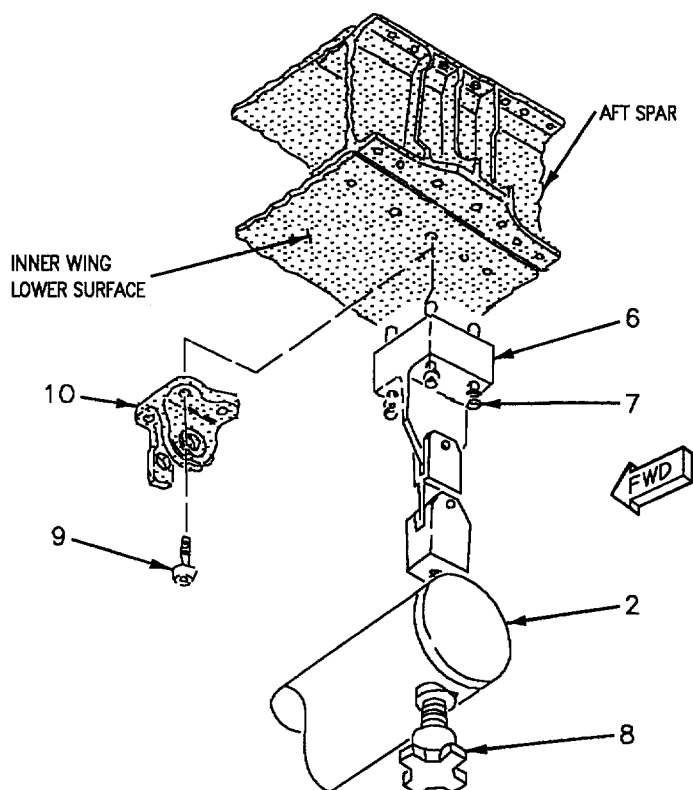


Figure 1. Inner Wing Removal and Installation Adapter (Sheet 2)



C
INBOARD FORWARD
PYLON ATTACH POINT



D
INBOARD AFT PYLON
ATTACH POINT

Figure 1. Inner Wing Removal and Installation Adapter (Sheet 3)

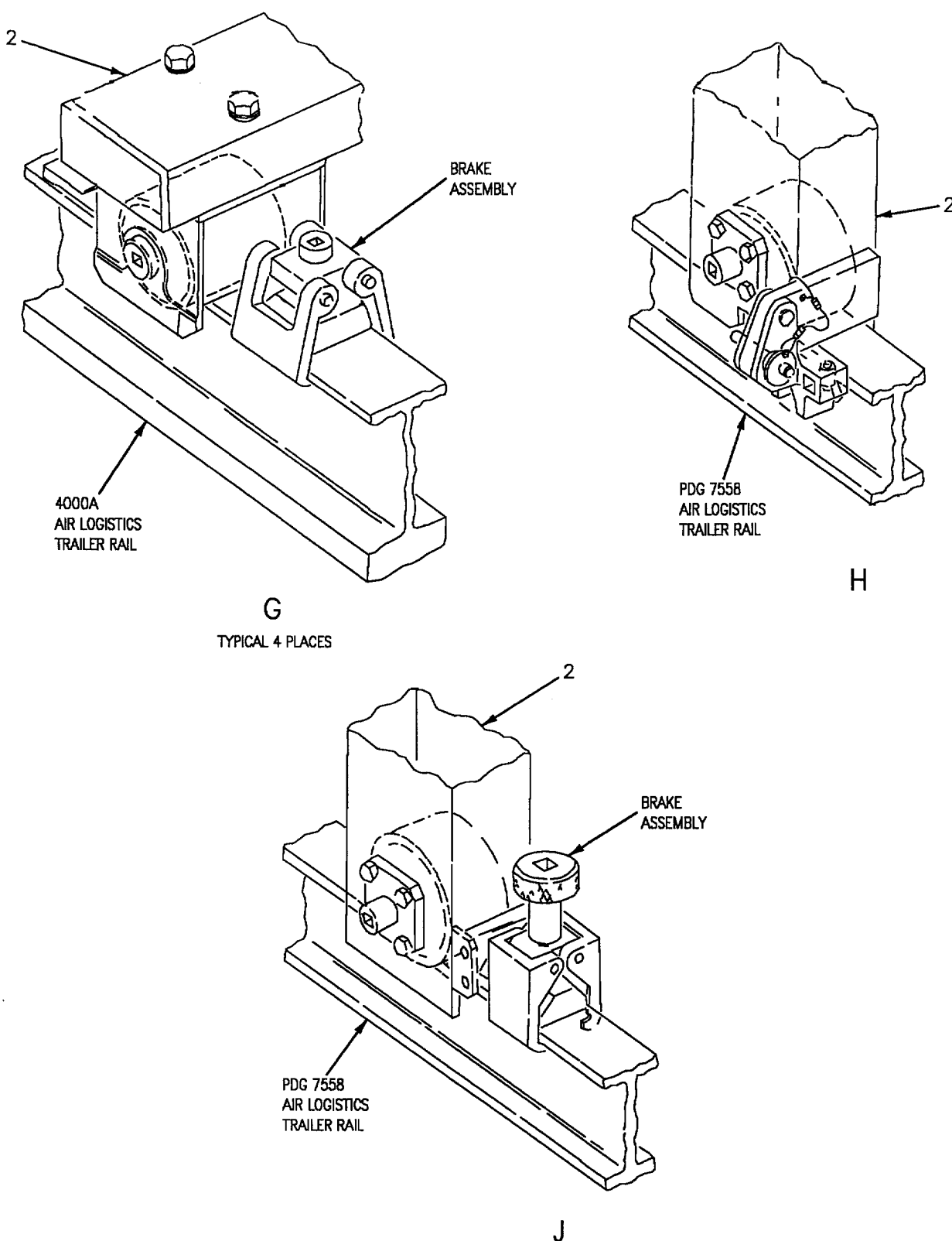


Figure 1. Inner Wing Removal and Installation Adapter (Sheet 5)

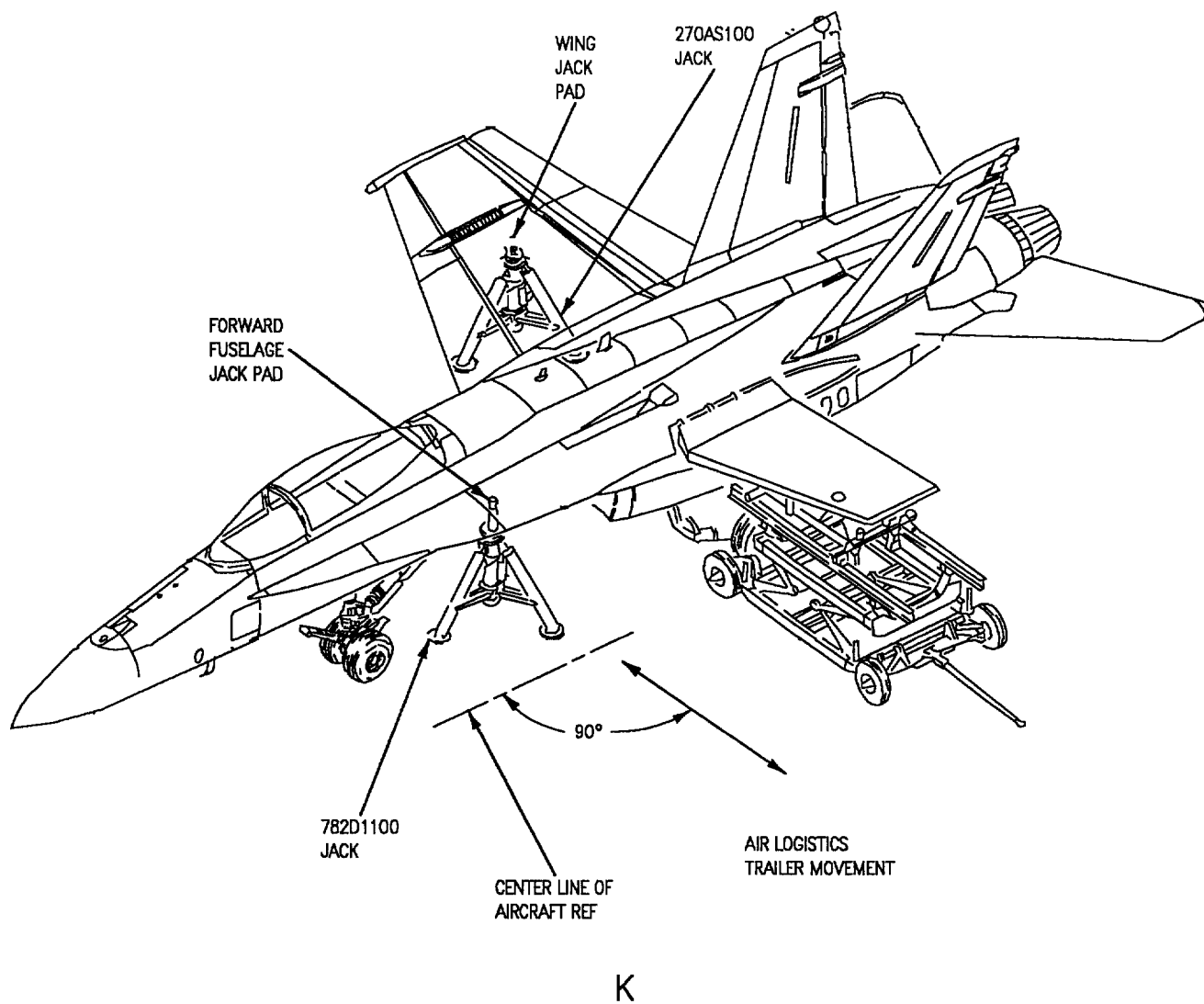


Figure 1. Inner Wing Removal and Installation Adapter (Sheet 6)

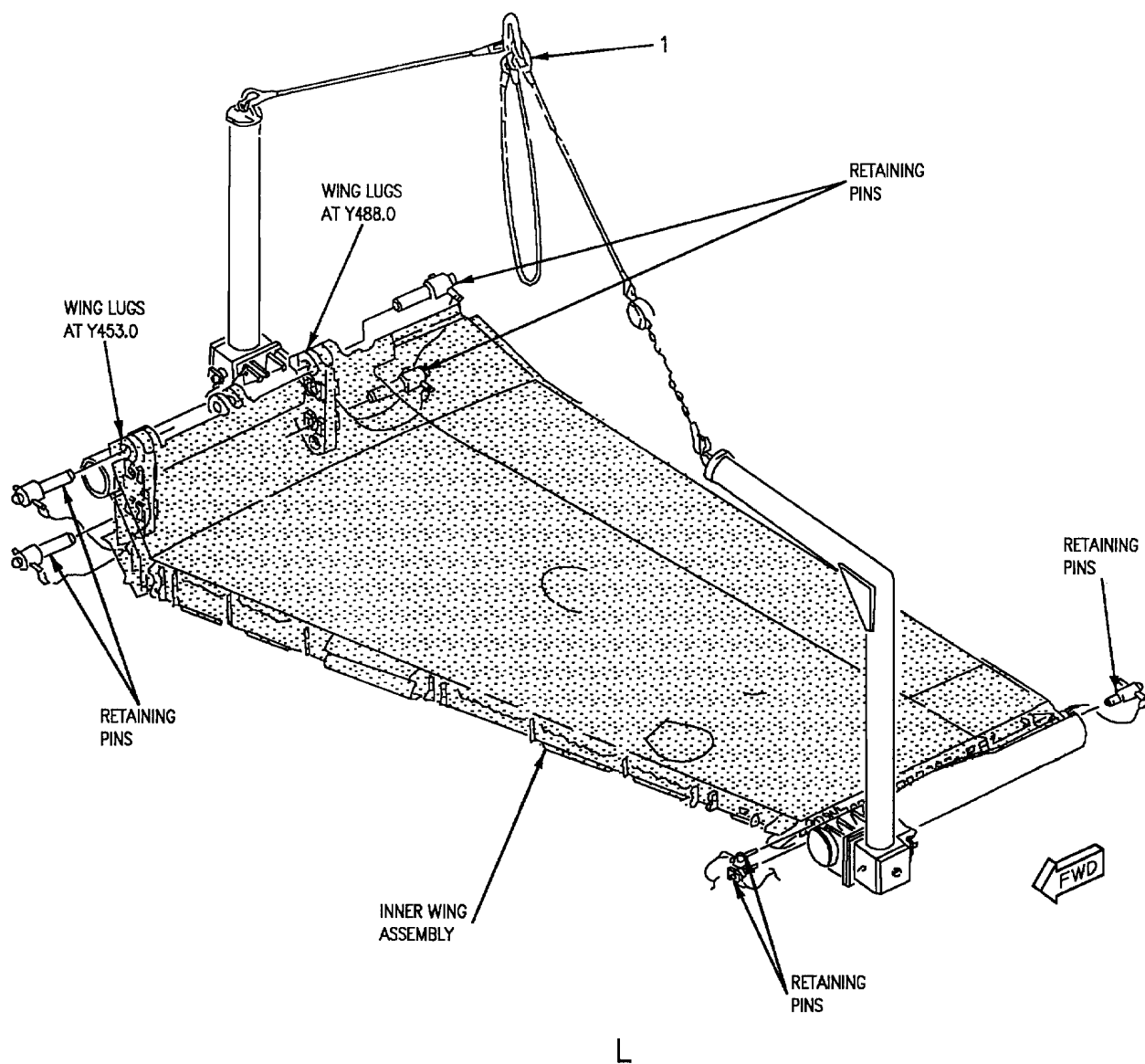


Figure 1. Inner Wing Removal and Installation Adapter (Sheet 7)

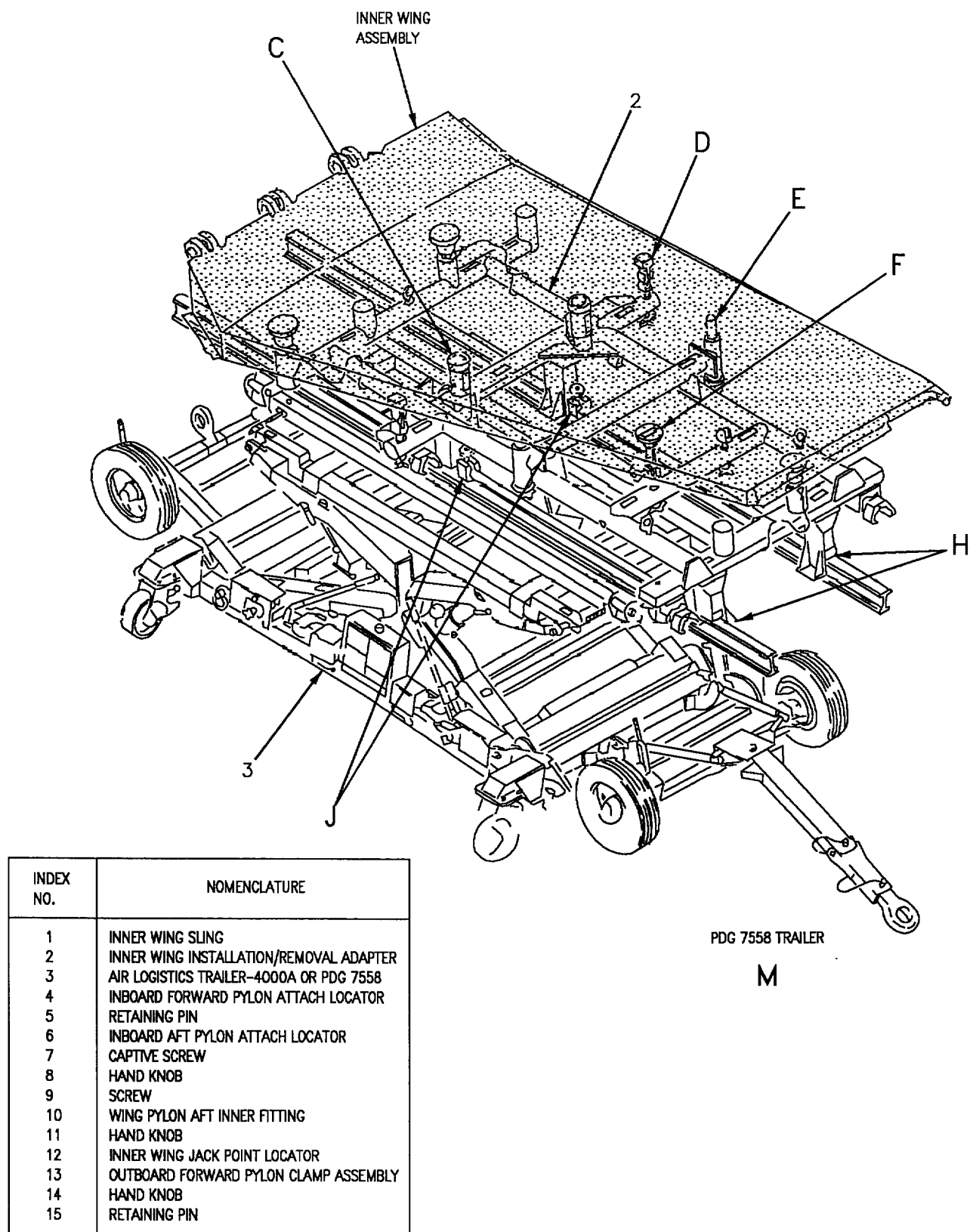


Figure 1. Inner Wing Removal and Installation Adapter (Sheet 8)

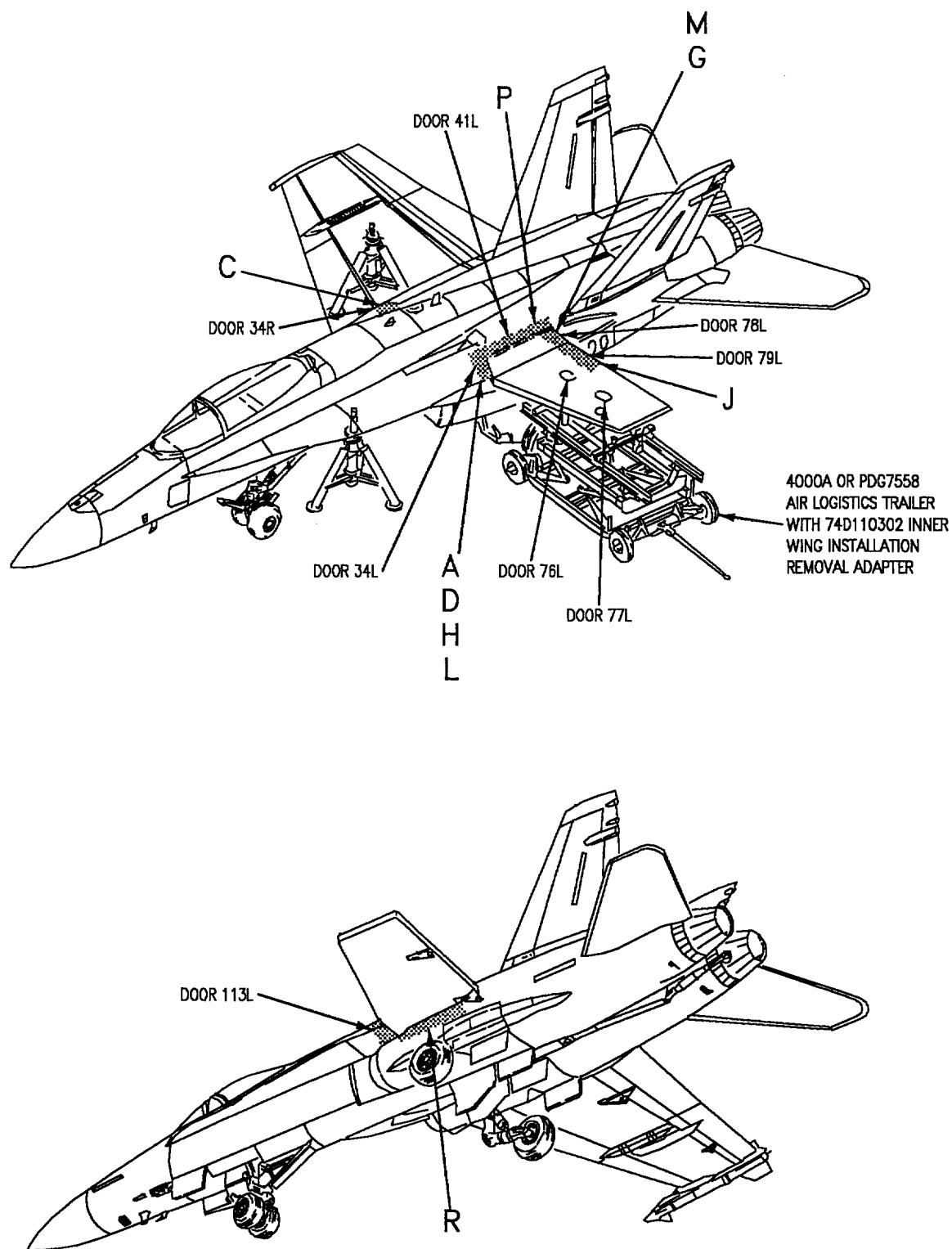


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 1)

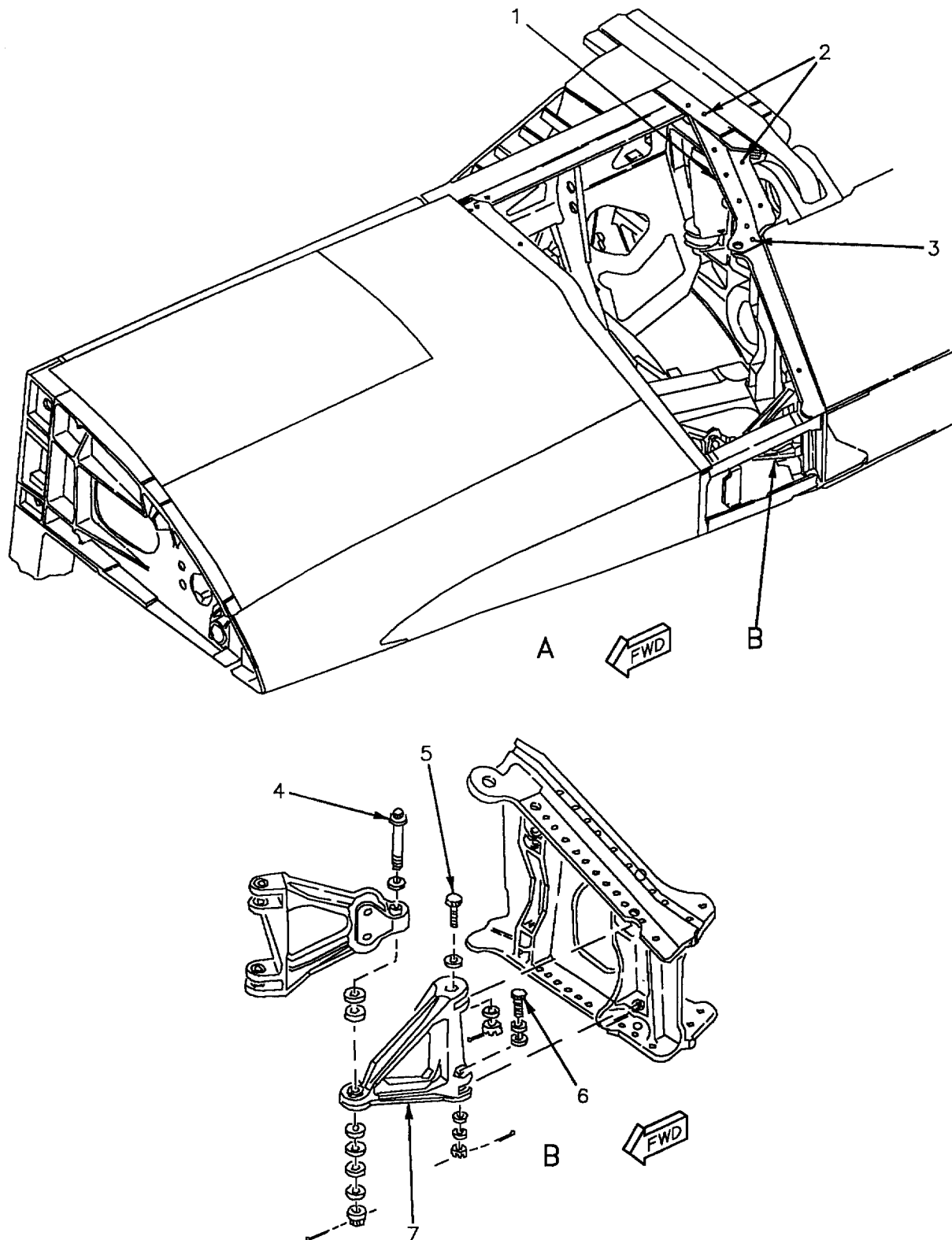


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 2)

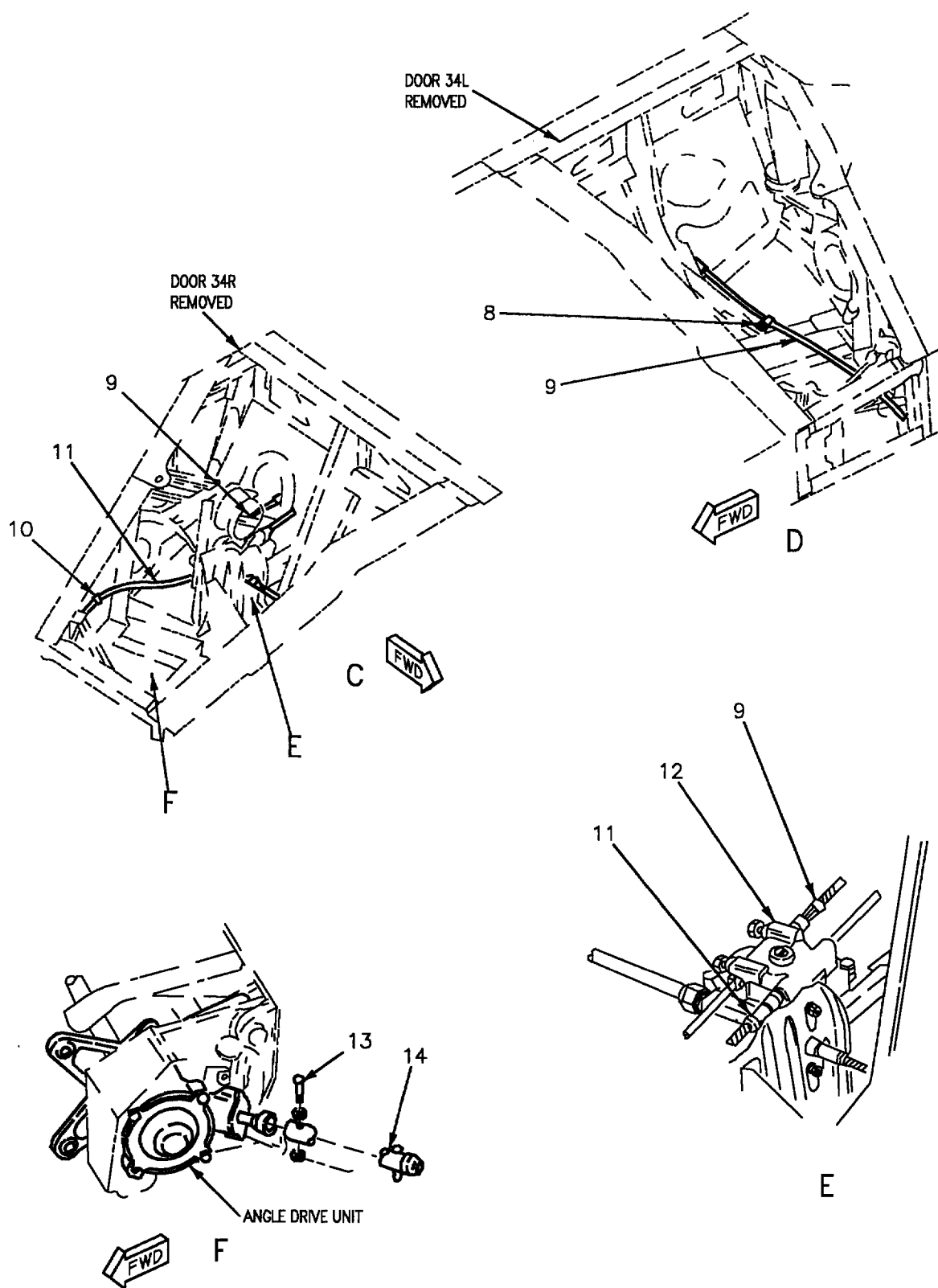


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 3)

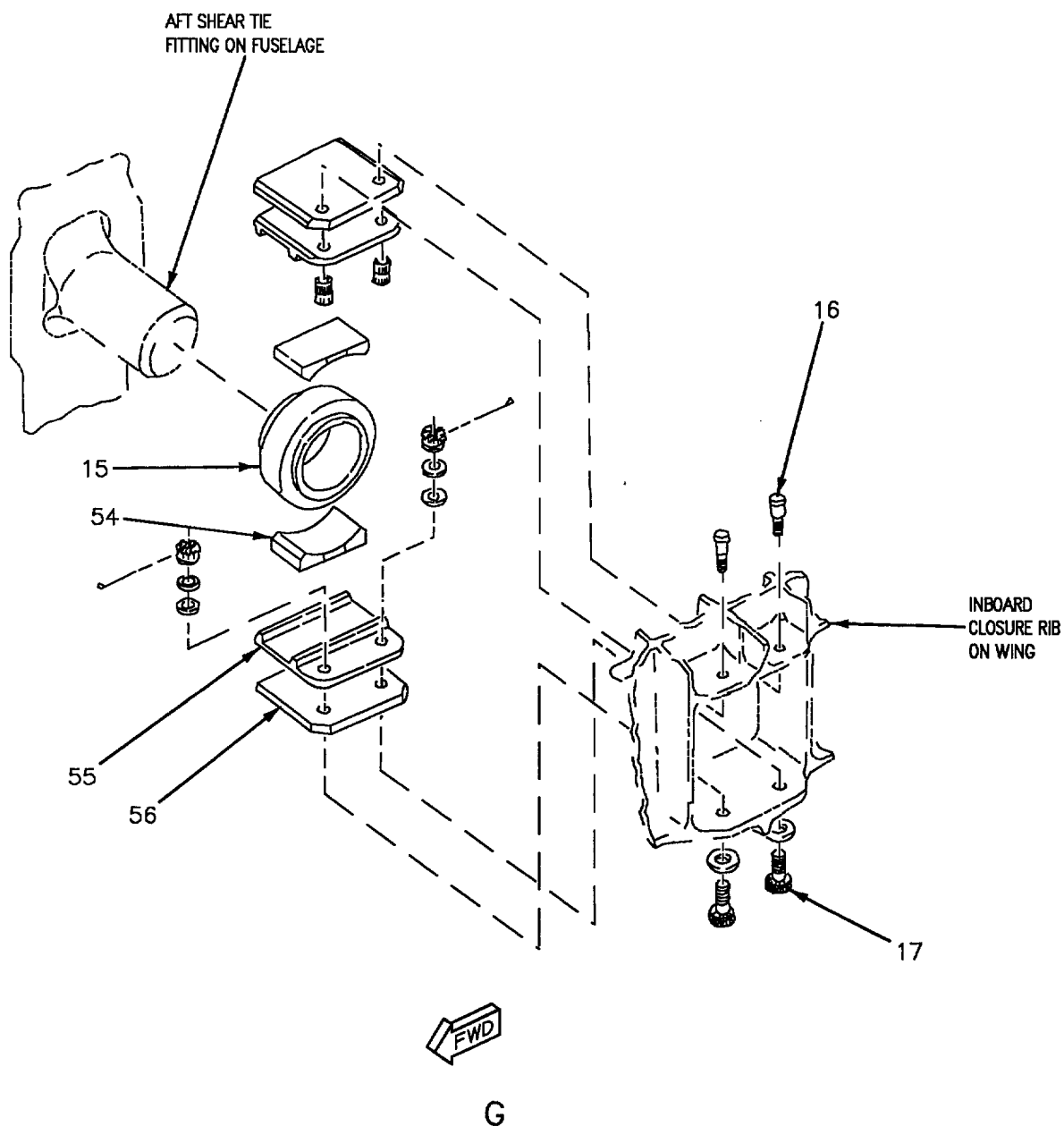


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 4)

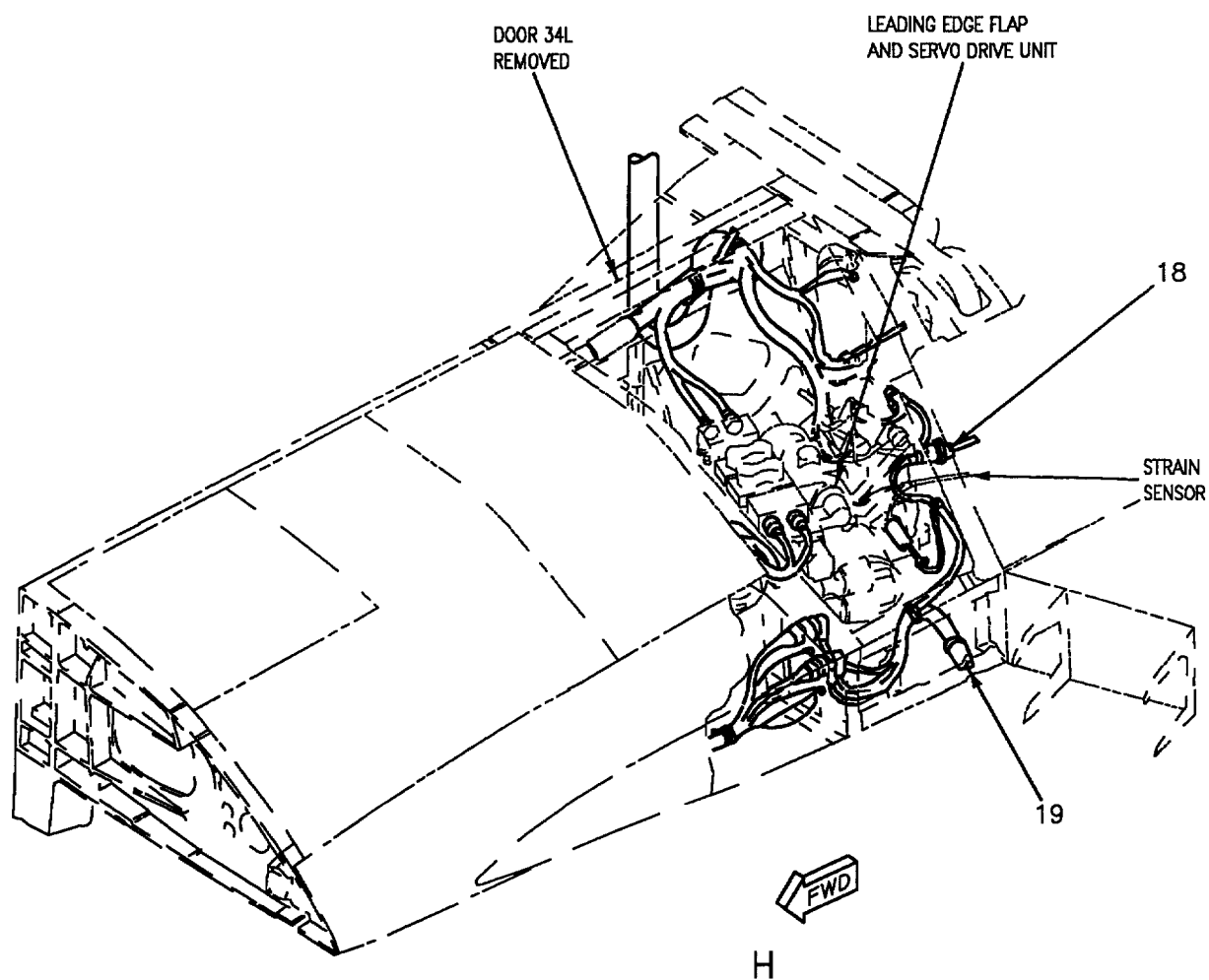


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 5)

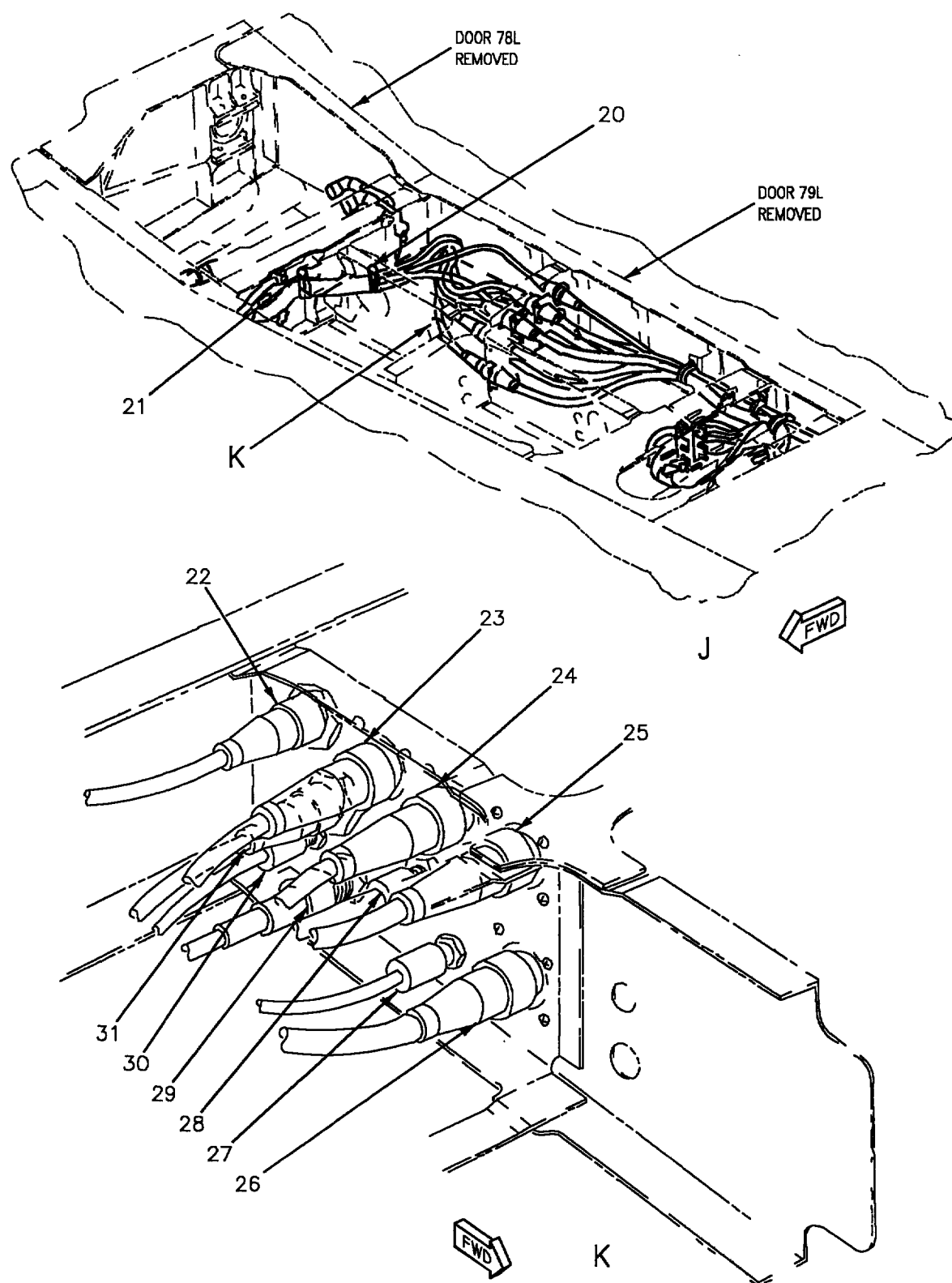


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 6)

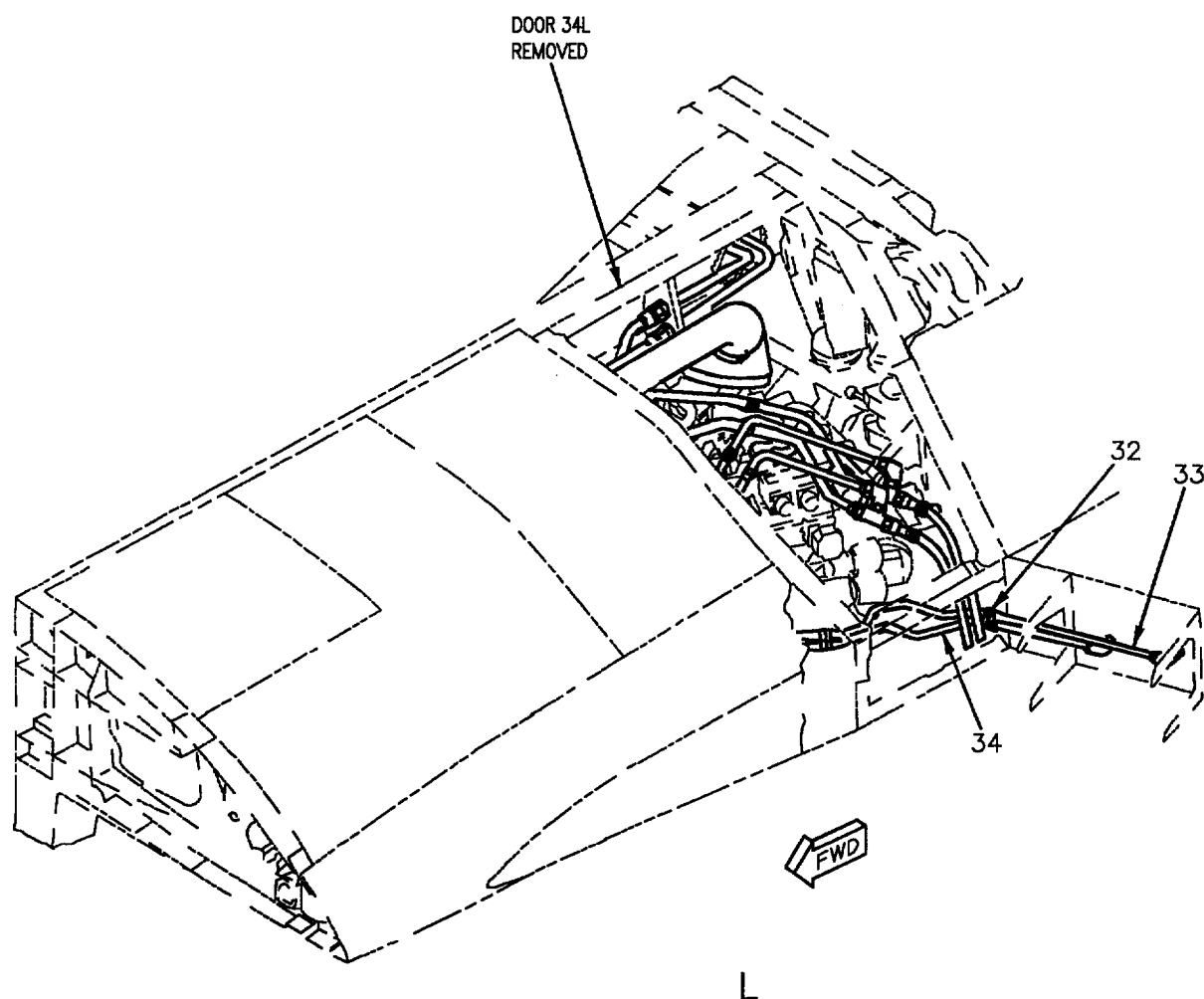


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 7)

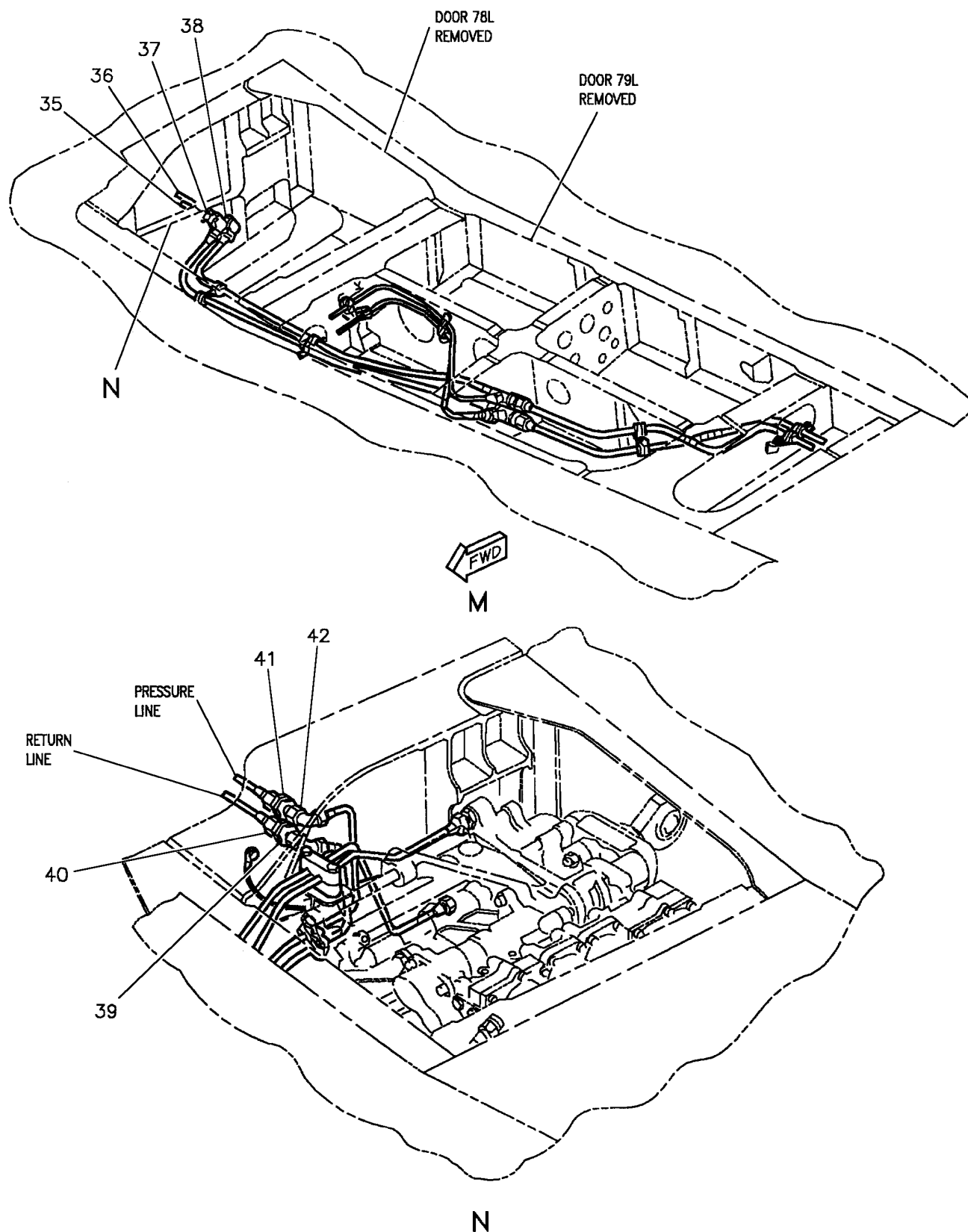


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 8)

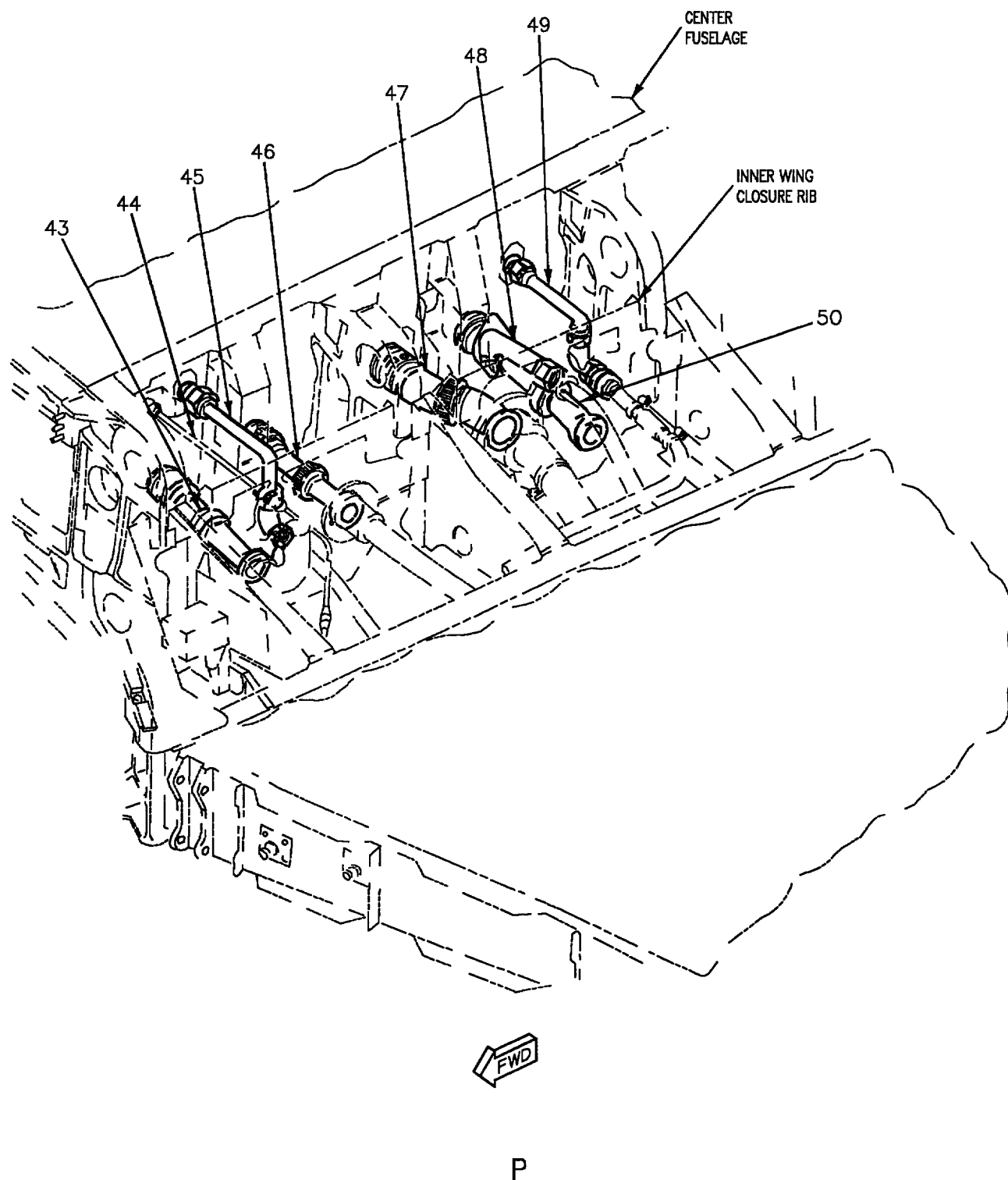


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 9)

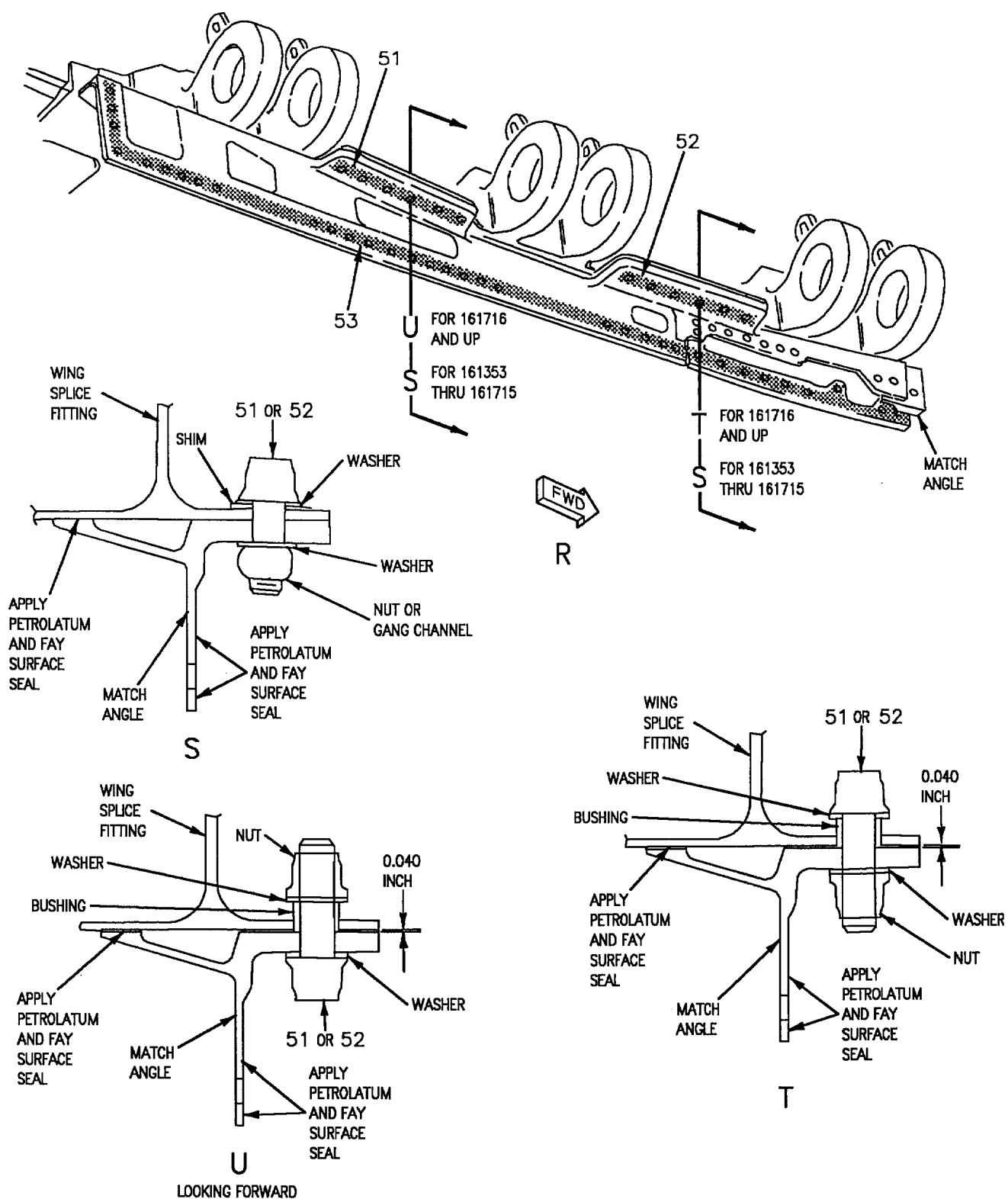
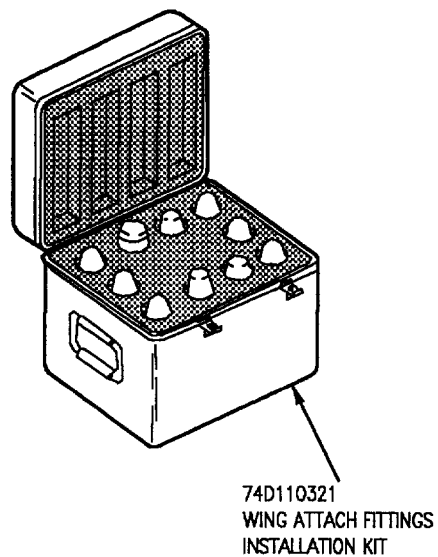


Figure 2. Inner Wing Removal and Installation Attachments (Sheet 10)

INDEX NO.	NOMENCLATURE
1	UPPER CLOSURE FORMER
2	HI-LOK RIVET
3	BOLT
4	CENTERPOINT BOLT
5	BOLT
6	BOLT
7	FORWARD SHEAR TIE LINK
8	CLAMP
9	CABLE
10	CLAMP
11	CABLE
12	WING LOCK CONTROL
13	BOLT
14	SHAFT
15	AFT SHEAR TIE BEARING
16	HI-LOK RIVET
17	BOLT
18	ELECTRICAL CONNECTOR
19	ELECTRICAL CONNECTOR
20	CLAMP
21	CLAMP
22	ELECTRICAL CONNECTOR
23	ELECTRICAL CONNECTOR
24	ELECTRICAL CONNECTOR
25	ELECTRICAL CONNECTOR
26	ELECTRICAL CONNECTOR
27	ELECTRICAL CONNECTOR
28	ELECTRICAL CONNECTOR
29	ELECTRICAL CONNECTOR
30	ELECTRICAL CONNECTOR
31	ELECTRICAL CONNECTOR
32	CLAMP
33	HYDRAULIC TUBE
34	HYDRAULIC TUBE
35	HYDRAULIC TUBE
36	HYDRAULIC TUBE
37	ELBOW
38	ELBOW
39	HYDRAULIC TUBE
40	JAMNUT
41	JAMNUT
42	HYDRAULIC TUBE
43	FUEL LINE
44	FUEL LINE
45	FUEL LINE
46	FUEL LINE
47	FUEL LINE
48	FUEL LINE
49	FUEL LINE
50	FUEL LINE
51	BOLTS
52	BOLTS
53	SCREWS
54	SLIDER BLOCK
55	RETAINER
56	SHIM

Figure 2. Inner Wing Removal and Installation Attachments (Sheet 11)



INDEX NO.	NOMENCLATURE	DASH NO.	FUSELAGE STATION
1	GUIDE PIN	-2015	Y488 LOWER HOLE
2	GUIDE PIN	-2013	Y470.5 LOWER HOLE
3	ALIGNMENT PIN	-1003	Y453 UPPER HOLE
4	ALIGNMENT PIN	-1003	Y470.5 UPPER HOLE
5	ALIGNMENT PIN	-1003	Y488 UPPER HOLE
6	GUIDE PIN	-2009	UPPER HOLES
7	GUIDE PIN	-2011	Y453 LOWER HOLE
8	ALIGNMENT PIN	-1001	Y453 LOWER HOLE
9	ALIGNMENT PIN	-1001	Y470.5 LOWER HOLE
10	ALIGNMENT PIN	-1001	Y488 LOWER HOLE
11	ATTACH PIN	74A110679-2019	Y470.5 LOWER HOLE
12	ATTACH PIN	74A110680-1001	Y470.5 UPPER HOLE
13	ATTACH PIN	74A110679-2023	Y453 LOWER HOLE
14	ATTACH PIN	74A110680-1005	Y453 UPPER HOLE
15	ATTACH PIN	74A110679-2021	Y488 LOWER HOLE
16	ATTACH PIN	74A110680-1003	Y488 LOWER HOLE
17	ATTACH BOLT AND HARDWARE	—	SIX PLACES

Figure 3. Inner Wing Removal and Installation Pins (Sheet 1)

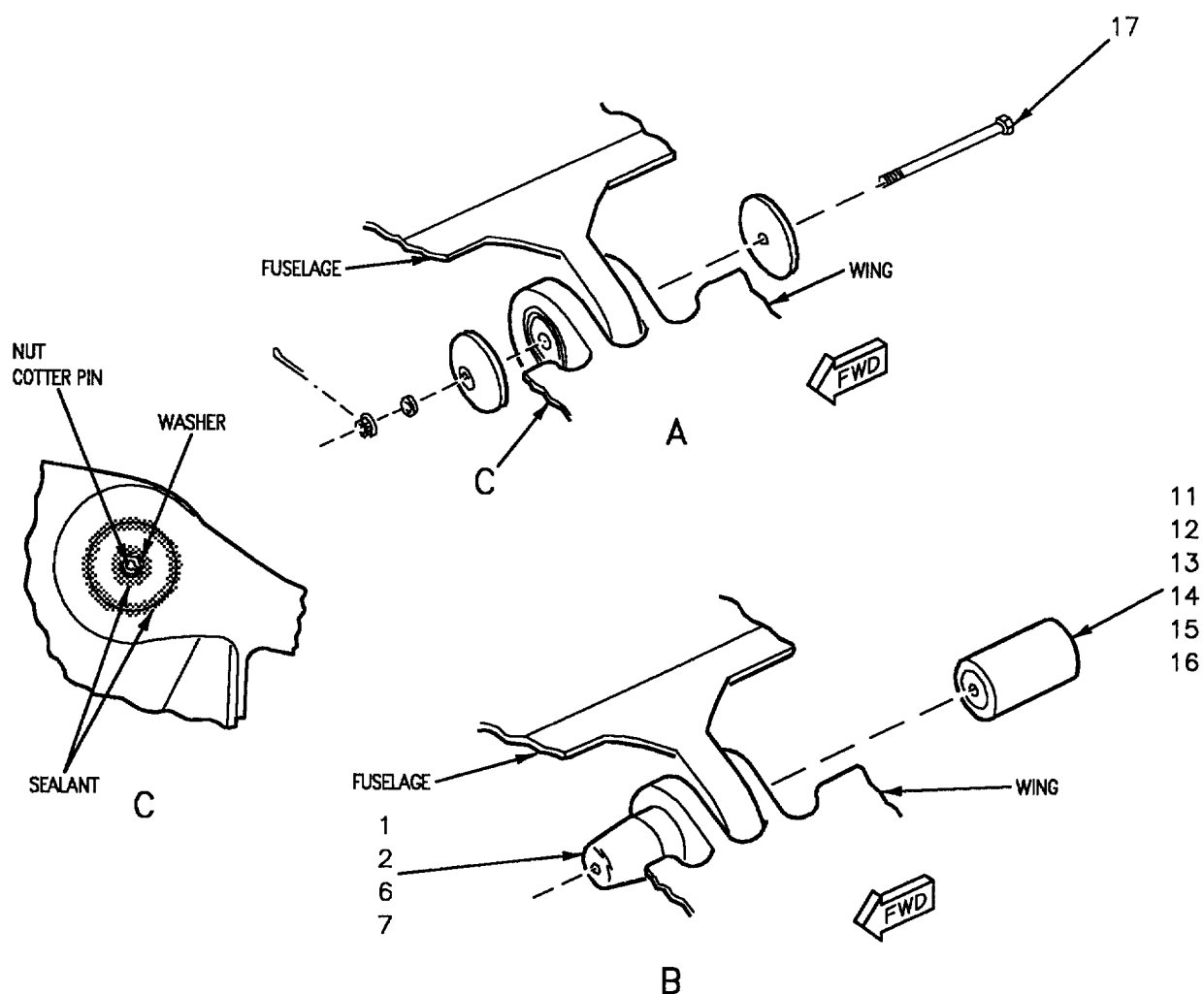
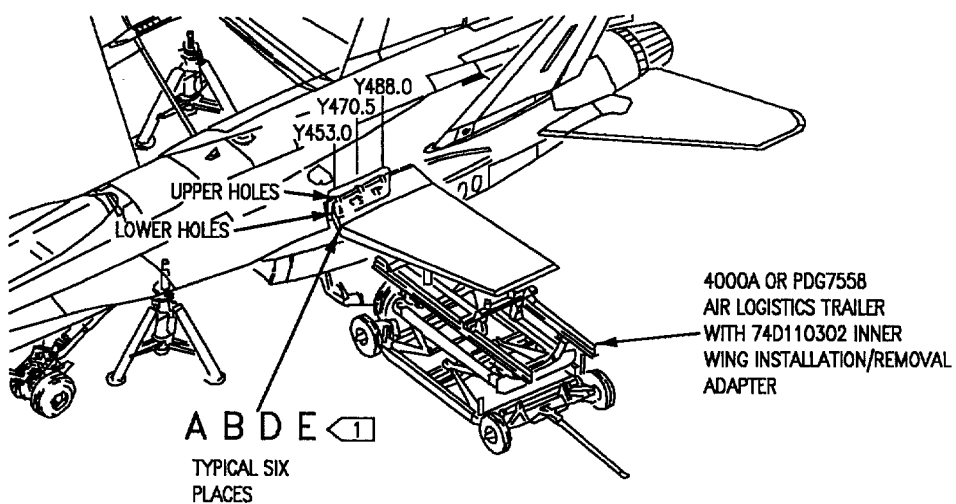


Figure 3. Inner Wing Removal and Installation Pins (Sheet 2)

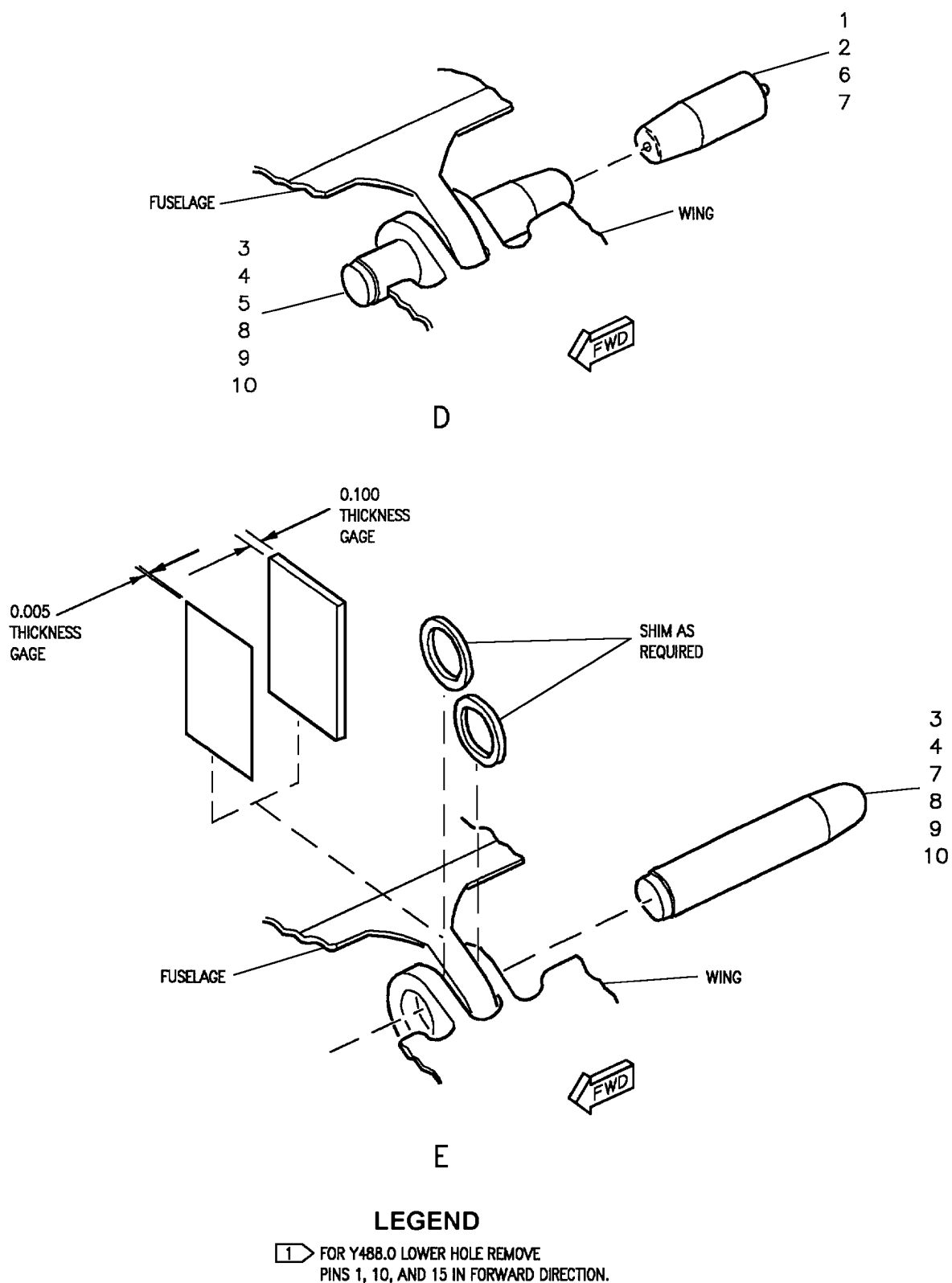


Figure 3. Inner Wing Removal and Installation Pins (Sheet 3)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

INNER WING REPLACEMENT

Reference Material

Structure Repair - Wing	A1-F18AC-SRM-210
Inner Wing Skins and Attach Pins	WP003 00
Inner Wing Removal and Installation	WP025 00
Cable Assemblies	A1-F18AC-WRM-040
74A754001 Left Wing Cable Assembly	WP540 01
74A754201 Left Wing Cable Assembly	WP542 01
74A754202 Left Wing Cable Assembly	WP542 02
74A754203 Left Wing Cable Assembly	WP542 03
74A754204 Left Wing Cable Assembly	WP542 04
74A754206 Left Wing Cable Assembly	WP542 06
74A754208 Left Wing Cable Assembly	WP542 08
74A754212 Left Wing Cable Assembly	WP542 12
74A755001 Right Wing Cable Assembly	WP550 01
74A755201 Right Wing Cable Assembly	WP552 01
74A755202 Right Wing Cable Assembly	WP552 02
74A755203 Right Wing Cable Assembly	WP552 03
74A755204 Right Wing Cable Assembly	WP552 04
74A755206 Right Wing Cable Assembly	WP552 06
74A755208 Right Wing Cable Assembly	WP552 08
74A755212 Right Wing Cable Assembly	WP552 12
Integrated Flight Controls	A1-F18AC-570-300
Wing Lock Warning Switch (17S-U013 or 17S-V014)	WP054 00
Wing Fold Inhibit Switch (17S-U015 or 17S-V016)	WP055 00
Structure Repair - General Information	A1-F18AC-SRM-200
Locating Blind Holes and Trim Lines	WP004 03
Weapon Control System	A1-F18C-740-300
Electrical Fuzing Adapters (61CPE047, 61CPP028, 61CPU030 or 61CPV031)	WP019 00
AIM-7 Wing Antenna AS-3354/APG (60E-U013 or 60E-V016)	WP021 00
Wiring Repair with Parts Data General Wiring Repair Procedures	A1-F18AC-WRM-000

Alphabetical Index

Subject	Page No.
Replacement	2
Installation	3
Removal	2

Record of Applicable Technical Directives

None

Support Equipment Required

None

Materials Required

None

(A1-F18AC-WRM-040, WP542 02 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Open splice WTV001 (39) and disconnect wires for cable assembly 74A755202 (37) (A1-F18AC-WRM-040, WP552 02 and A1-F18AC-WRM-000). Remove cable assembly.

1. REPLACEMENT.

2. These procedures are for the left inner wing. Procedures for right inner wing are identical except as indicated.

3. REMOVAL. See figures 1 and 4.

a. Remove inner wing (WP025 00).



Titanium alloy tubes will break if excessively flexed or twisted during removal.

b. Remove hydraulic fittings (1 and 2, figure 1).

c. Remove clamps (3) and attaching hardware.

d. Remove hydraulic tube assemblies (4, 5, 10, and 11).

e. Remove hydraulic fittings (6 and 9).

f. Remove hydraulic tube assemblies (7, 8, 12, and 13).

NOTE

If required, remove spiral plastic tubing before removing cable assemblies.

g. Remove clamps (4, figure 2) and attaching hardware.

h. Left side: Open splice WTU001 (3) and disconnect wires for cable assembly 74A754202 (1)

i. Left side: Open splice WTU001 (3) and disconnect wires for cable assembly 74A754208 (2) (A1-F18AC-WRM-040, WP542 08 and A1-F18AC-WRM-000). Remove cable assembly. Right side: Open splice WTV001 (39) and disconnect wires for cable assembly 74A755208 (38) (A1-F18AC-WRM-040, WP552 08 and A1-F18AC-WRM-000). Remove cable assembly.

j. Remove wing lock warning switch (5) (A1-F18AC-570-300, WP054 00).

k. Left side: Disconnect ground GND2-U008 (6), open splices WTU001 and WTU005 (3 and 8) and disconnect wires for cable assembly 74A754203 (7) (A1-F18AC-WRM-040, WP542 03 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Disconnect ground GND2-V006 (40), open splices WTV001 and WTV005 (35 and 42) and disconnect wires for cable assembly 74A755203 (41) (A1-F18AC-WRM-040, WP552 03 and A1-F18AC-WRM-000). Remove cable assembly.

NOTE

Cable assembly 74A54212 (28) is interconnected to cable assembly 74A754201 (9) and removed as one assembly.

l. Left side: Disconnect grounds GND1-U001, GND10U006, GND2-U002, GND3-U008, GND4-U002, GND9-U002, GND9-U003, and GND9-U006 (26, 29, 30, 31, 32, 34, 35, and 36), open splice WTU005 (8) and disconnect wires for cable assembly 74A754201 (9) (A1-F18AC-WRM-040, WP542 01 and A1-F18AC-WRM-000). Disconnect ground GND10U006 (33) and remove cable assembly 74A754212 (28) with cable assembly 74A754201 (9) (A1-F18AC-WRM-040, WP542 12).

NOTE

Cable assembly 74A55212 (51) is interconnected to cable assembly 74A755201 (43) and removed as one assembly.

Right side: Disconnect grounds GND10V001, GND2-V002, GND3-V002, GND4-U001, GND9-V001, and GND9-V002 (52, 54, 55, 57, 58, and 59), open splice WTV005 (42) and disconnect wires for cable assembly 74A755201 (43) (A1-F18AC-WRM-040, WP552 01 and A1-F18AC-WRM-000). Disconnect ground GND10V006 (56) and remove cable assembly 74A755212 (51) with cable assembly 74A755201 (43) (A1-F18AC-WRM-040, WP552 12).

m. Remove wing fold inhibit switch (10) (A1-F18AC-570-300, WP055 00).

n. Remove 4 bolts (11) and attaching hardware and remove connector receptacle (12).

o. Left side: Disconnect connectors at each end of cable assembly 74A754001 (13) (A1-F18AC-WRM-040, WP540 01 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Disconnect connectors at each end of cable assembly 74A755001 (44) (A1-F18AC-WRM-040, WP550 01 and A1-F18AC-WRM-000). Remove cable assembly.

p. Remove illumination antenna AIM-7 (14) (A1-F18AC-740-300, WP021 00).

q. Left side: Disconnect ground GND10U002 (18), open splice WTU005 (8) and disconnect wires for cable assembly 74A754206 (15) (A1-F18AC-WRM-040, WP542 06 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Disconnect ground GND10V002 (48), open splices WTV005 (42) and disconnect wires for cable assembly 74A755206 (50) (A1-F18AC-WRM-040, WP552 06 and A1-F18AC-WRM-000). Remove cable assembly.

r. Remove cable adapter (16) (A1-F18AC-740-300, WP019 00).

s. Left side: Disconnect grounds GND1-U004, GND10U001, GND2-U004, GND3-U001, GND4-U001, GND9-U004, and GND9-U005 (19, 20, 21, 22, 24, 26, and 27), open splice WTU005 (8) and disconnect wires for cable assembly 74A754204 (17) (A1-F18AC-WRM-040, WP542 04 and A1-F18AC-WRM-000). Remove cable assembly.

Right side: Disconnect grounds GND10V001, GND2-V003, GND3-V001, GND4-V004, and GND9-V003 (45, 46, 47, 52, and 53), open splice WTV005 (42) and disconnect wires for cable assembly 74A755204 (49) (A1-F18AC-WRM-040, WP552 04 and A1-F18AC-WRM-000). Remove cable assembly.

t. Remove 4 bolts (23) and attaching hardware and remove connector receptacle (25).

NOTE

Retain existing inner wing until replacement inner wing has been completely built up and installed.

4. **INSTALLATION.** See figures 1, 2, 3, and 4. Replacement inner wing includes a spared 74K110002 kit. Replacement of inner wing includes formers, angles, and access coders that make up the kit.

a. Remove replacement inner wing from shipping container and attach adapter and place inner wing and adapter on trailer (WP025 00).

b. The replacement inner wing has bagged loose items attached, assemble as below:

(1) Trim forward edge of skin (8, figure 4) and mate drill. For locating blind holes and trim line (A1-F18AC-SRM-200, WP004 03). Install skin (8) and spacer (11) on replacement wing.

(2) Trim inboard edge of skin (9), for locating trim line (A1-F18AC-SRM-200, WP004 03). Install skin (8) on replacement wing.

(3) Mate drill skin (10), for locating blind holes (A1-F18AC-SRM-200, WP004 03). Install skin (10) on replacement wing.

(4) Install seal (3), shim (5), and retainer (4) per seal replacement (WP003 00).

(5) Install adapter (6 and 7) on replacement wing.

(6) Mate drill retainer (13), bonding strip (14), and bracket (22). For locating blind holes (A1-F18AC-SRM-200, WP004 03). Install retainer (13), bonding strip (14) and bracket (22) on replacement wing.

(7) Mate drill retainer (15) and bonding strip (16). For locating blind holes (A1-F18AC-SRM-200, WP004 03). Install retainer (15) and bonding strip (16) on replacement wing.

(8) Mate drill retainer (18) and bonding strip (17). For locating blind holes (A1-F18AC-SRM-200, WP004 03). Install retainer (18) and bonding strip (17) on replacement wing.

(9) Mate drill retainer (20), bonding strip (19), and plate (21). For locating blind holes (A1-F18AC-SRM-200, WP004 03). Install retainer (20) and bonding strip (19) and plate (21) on replacement wing.

(10) Mate drill bracket (23), for locating blind holes (A1-F18AC-SRM-200, WP004 03). Install bracket (23) on replacement wing.

(11) Install seal (24), and retainer (25) per seal replacement (WP003 00).

c. Install connector receptacle (25, figure 2) with 4 bolts (23) and attaching hardware.

d. Left side: Install existing cable assembly 74A754204 (17). Connect grounds GND1-U004, GND10U001, GND2-U004, GND3-U001, GND4-U001, GND9-U004, and GND9-U005 (19, 20, 21, 22, 24, 26, and 27). Splice wires for cable assembly 74A754204 (17) at splice WTU005 (8) (A1-F18AC-WRM-040, WP542 04 and A1-F18AC-WRM-000).

Right side: Install existing cable assembly 74A755204 (49). Connect grounds GND10V001, GND2-V003, GND3-V001, GND4-V004, and GND9-V003 (45, 46, 47, 52, and 53). Splice wires for cable assembly 74A755204 (49) at splice WTV005 (42) (A1-F18AC-WRM-040, WP542 04 and A1-F18AC-WRM-000).

e. Install existing cable adapter (16) (A1-F18AC-740-300, WP019 00).

f. Left side: Install existing cable assembly 74A754206 (15). Connect ground GND10U002 (18). Splice wires for cable assembly 74A754206 (15) at splice WTU005 (8) (A1-F18AC-WRM-040, WP542 06 and A1-F18AC-WRM-000).

Right side: Install existing cable assembly 74A755206 (50). Connect ground GND10V002 (48). Splice wires for cable assembly 74A755206 (50) at splice WTV005 (42) (A1-F18AC-WRM-040, WP552 06 and A1-F18AC-WRM-000).

g. Install existing illumination antenna AIM-7 (14) (A1-F18AC-740-300, WP021 00).

h. Left side: Install existing cable assembly 74A754001 (13). Reconnect connectors at each end of cable assembly 74A754001 (13) (A1-F18AC-WRM-040, WP540 01 and A1-F18AC-WRM-000).

Right side: Install existing cable assembly 74A55001 (44). Reconnect connectors at each end of cable assembly 74A755001 (44) (A1-F18AC-WRM-040, WP550 01 and A1-F18AC-WRM-000).

i. Install existing connector receptacle (12) with 4 bolts (11) and attaching hardware.

j. Install wing fold inhibit switch (10) (A1-F18AC-570-300, WP055 00).

NOTE

Cable assembly 74A54212 (28) is interconnected to cable assembly 74A754201 (9) and removed as one assembly.

k. Left side: Install existing cable assemblies 74A54212 and 74A754201 (28 and 29). Connect grounds GND1-U001, GND1-U006, GND2-U002, GND3-U008, GND4-U002, GND9-U002, GND9-U003, and GND9-U006 (26, 29, 30, 31, 32, 34, 35, and 36). Splice wires for cable assembly 74A754201 (9) at splice WTU005 (8) (A1-F18AC-WRM-040, WP542 01 and A1-F18AC-WRM-000). Connect ground GND1-U006 (33) (A1-F18AC-WRM-040, WP542 12).

NOTE

Cable assembly 74A55212 (51) is interconnected to cable assembly 74A755201 (43) and removed as one assembly.

Right side: Install existing cable assemblies 74A755212 and 74A755201 (51 and 43). Connect grounds GND1-V001, GND2-V002, GND3-V002, GND4-V001, GND9-V001, and GND9-V002 (52, 54, 55, 57, 58, and 59). Splice wires for cable assembly 74A755201 (43) at splice WTV005 (42) (A1-F18AC-WRM-040, WP552 01 and A1-F18AC-WRM-000). Connect ground GND1-V004 (56) (A1-F18AC-WRM-040, WP552 12).

l. Left side: Install existing cable assembly 74A754203 (7). Connect ground GND2-U008 (6). Splice wires for wires for cable assembly 74A754203 (7) at splice WTU001 (3 and 8) (A1-F18AC-WRM-040, WP542 03 and A1-F18AC-WRM-000).

Right side: Install existing cable assembly 74A755203 (41). Connect ground GND6-V006 (40). Splice wires for cable assembly 74A755203 (41) at splices WTV001 and WTV005 (35 and 42) (A1-F18AC-WRM-040, WP552 03 and A1-F18AC-WRM-000).

m. Install existing wing lock warning switch (5) (A1-F18AC-570-300, WP054 00).

n. Left side: Install existing cable assembly 74A754208 (2). Splice wire for cable assembly 74A754208 (2) at splice WTU001 (3) (A1-F18AC-WRM-040, WP542 08 and A1-F18AC-WRM-000).

Right side: Install existing cable assembly 74A755208 (38). Splice wire for cable assembly 74A755208 (38) at splice WTV001 (39) (A1-F18AC-WRM-040, WP552 08 and A1-F18AC-WRM-000).

o. Left side: Install existing cable assembly 74A754202 (1). Splice wire for cable assembly 74A754202 (1) at splice WTU001 (3) (A1-F18AC-WRM-040, WP542 02 and A1-F18AC-WRM-000).

Right side: Install existing cable assembly 74A755202 (37). Splice wire for cable assembly 74A755202 (37) at splice WTV001 (39) (A1-F18AC-WRM-040, WP552 02 and A1-F18AC-WRM-000).

p. Install existing clamps (4) and attaching hardware.

NOTE

If required, install spiral plastic tubing after installing cable assemblies.



Titanium alloy tubes will break if excessively flexed or twisted during removal.

q. Install existing hydraulic tube assemblies (7, 8, 12, and 13, figure 1).

r. Install existing hydraulic fittings (6 and 9).

s. Install existing hydraulic tube assemblies (4, 5, 10, and 11).

t. Install existing clamps (3) and attaching hardware.

u. Install existing hydraulic fittings (1 and 2).

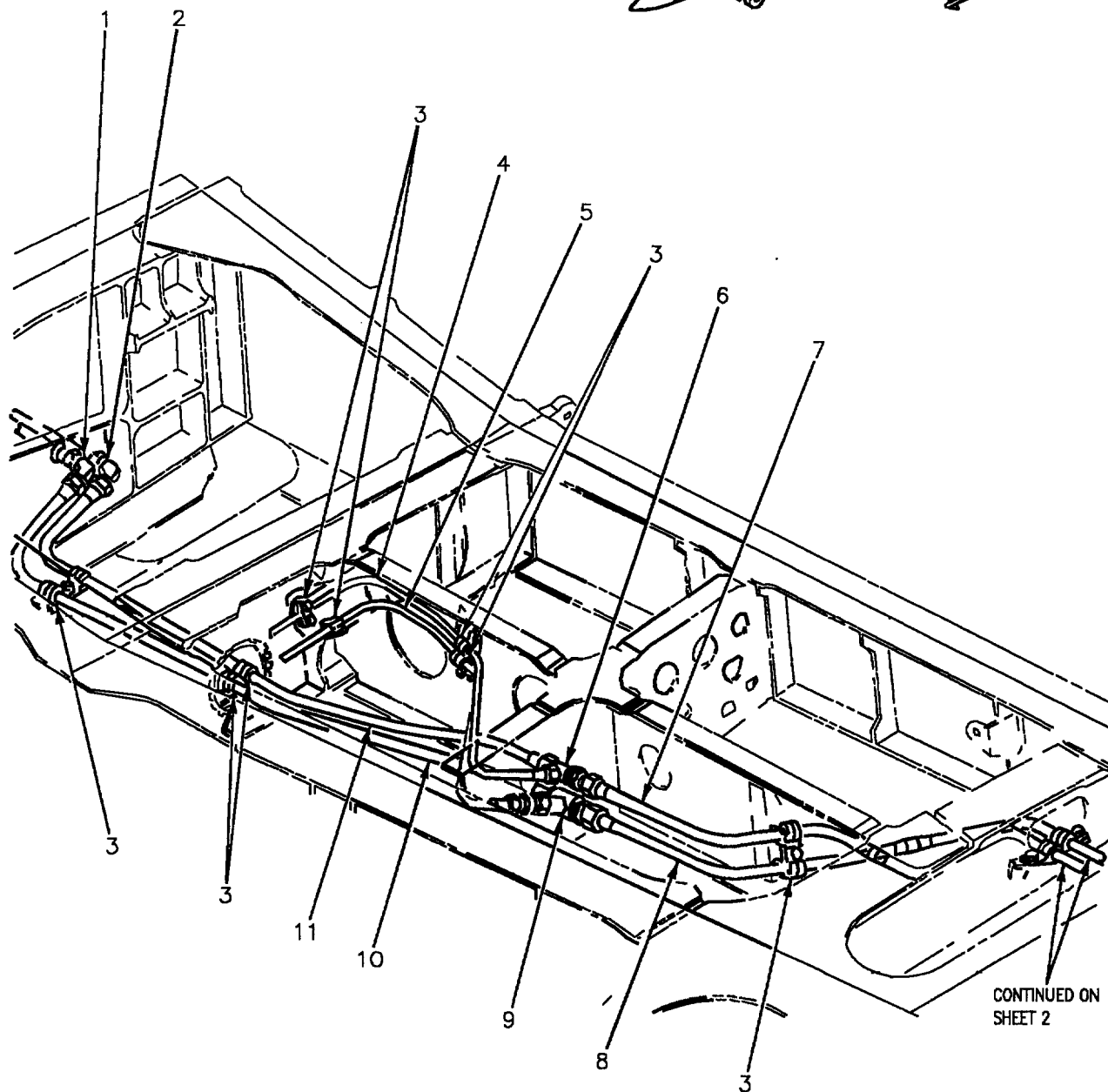
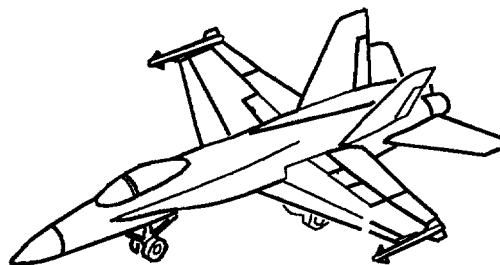
v. Install weld assembly (12, figure 4).

w. Install inner wing using replacement items listed below (WP025 00):

(1) Install fuel tube assemblies and adapters (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13, figure 3) on installed replacement wing.

(2) Mate drill drag load member (26, figure 4), for locating blind holes (A1-F18AC-SRM-200, WP004 03). Install drag load member (26) using bolts (28 and 32), washers (31 and 33), bushings (29 and 34), and nuts (30 and 35) as per sections H and J on installed replacement wing.

(3) Trim lower and forward ends and mate drill cover (27). For locating blind holes and trim lines (A1-F18AC-SRM-200, WP004 03). Install cover (27) on installed replacement wing.



25010101

Figure 1. Hydraulic Component Replacement (Sheet 1)

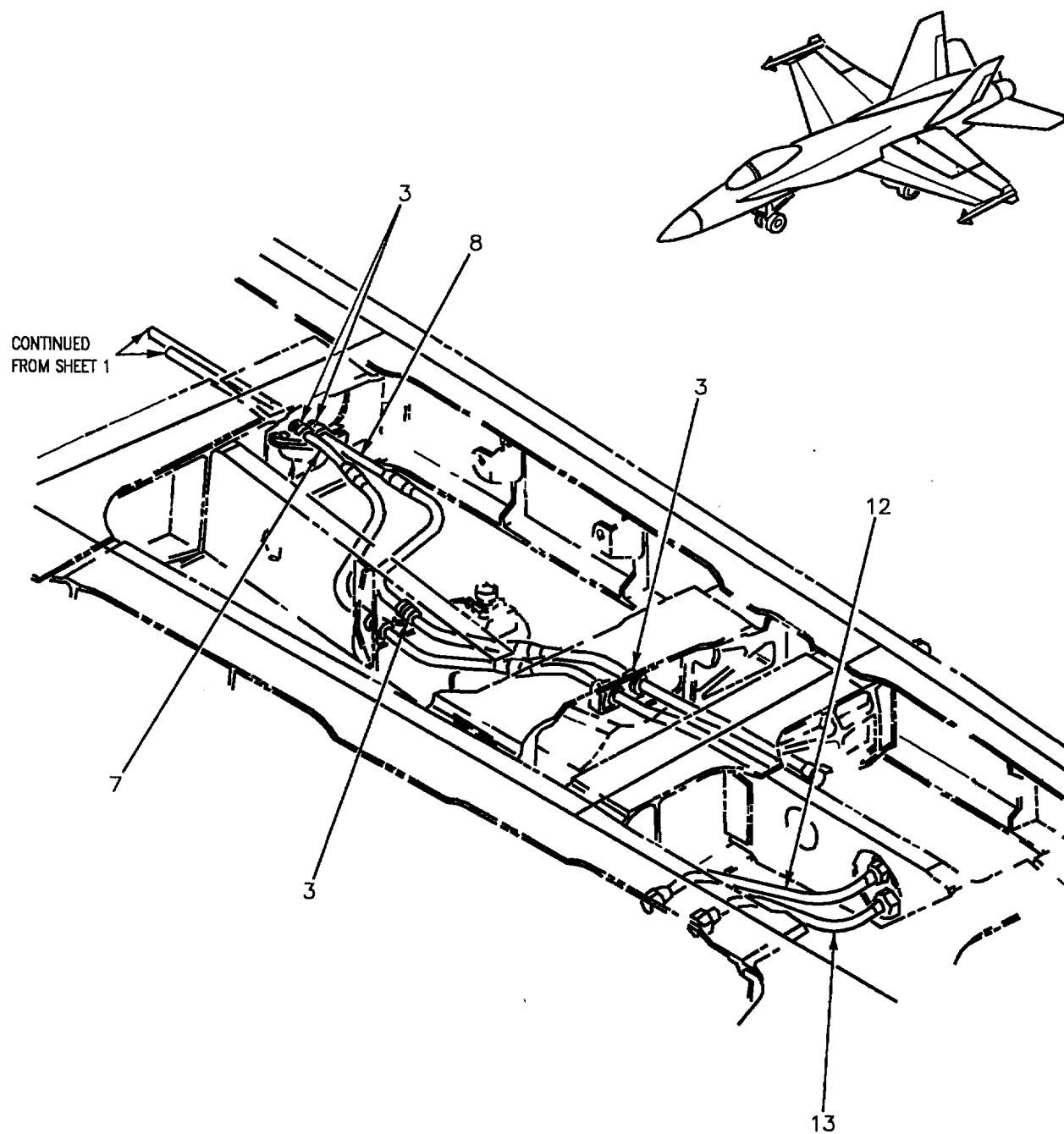


Figure 1. Hydraulic Component Replacement (Sheet 2)

INDEX	NOMENCLATURE
1	ADAPTER
2	ADAPTER
3	TUBE ASSEMBLY
4	TUBE ASSEMBLY
5	ADAPTER
6	TUBE ASSEMBLY
7	TUBE ASSEMBLY
8	TUBE ASSEMBLY
9	TUBE ASSEMBLY
10	TUBE ASSEMBLY
11	TUBE ASSEMBLY
12	TUBE ASSEMBLY
13	ADAPTER

Figure 1. Hydraulic Component Replacement (Sheet 3)

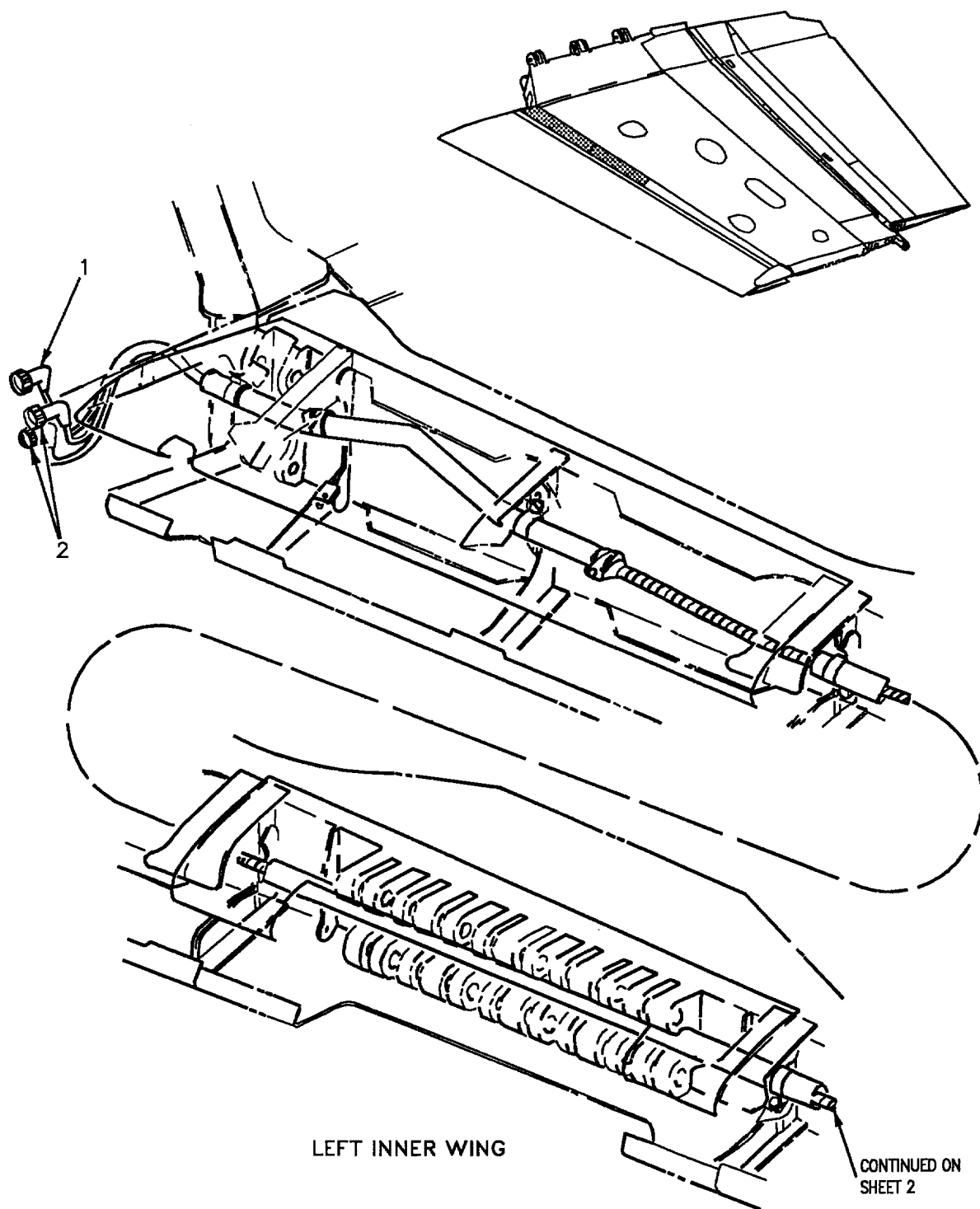


Figure 2. Electrical Component Replacement (Sheet 1)

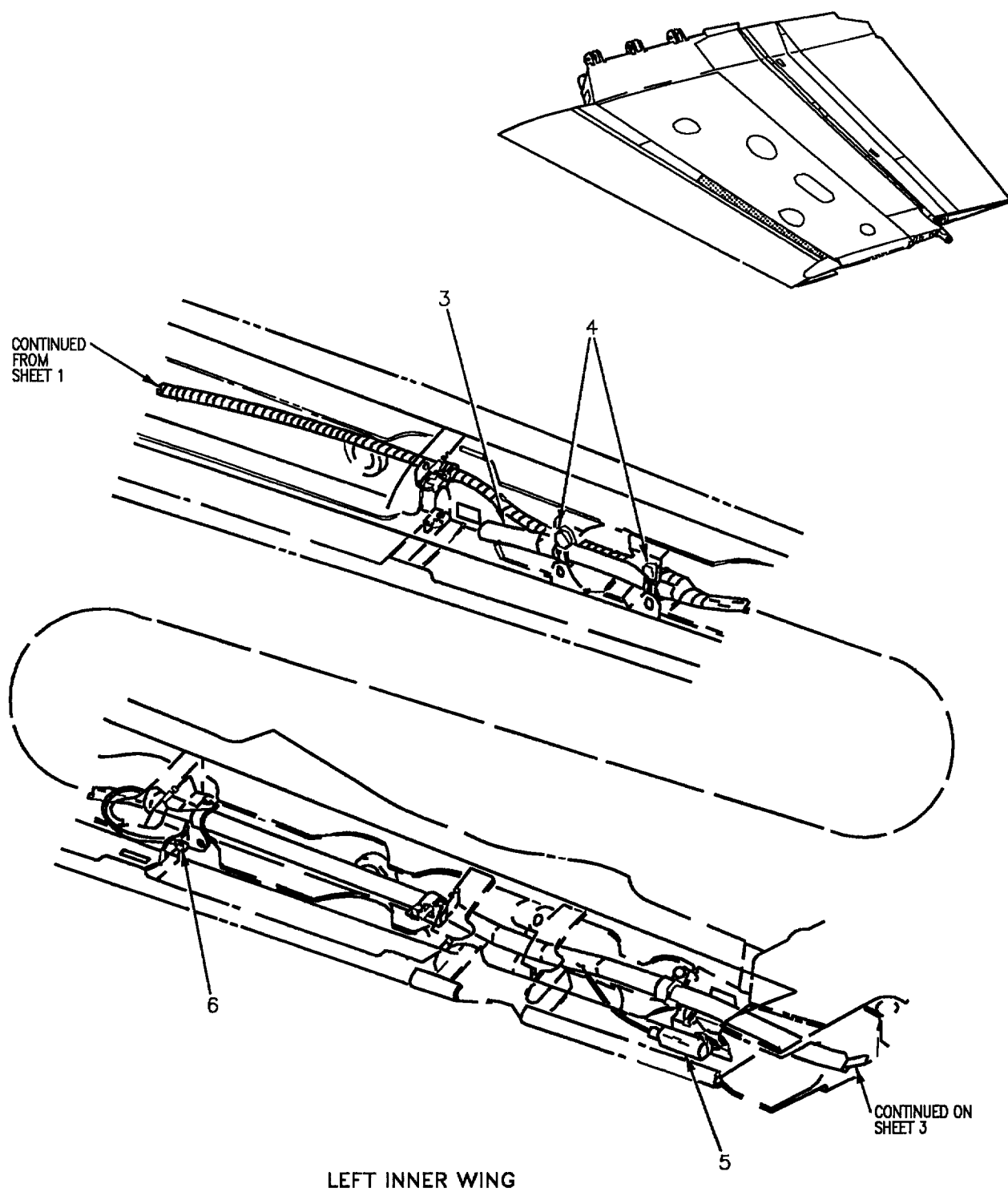
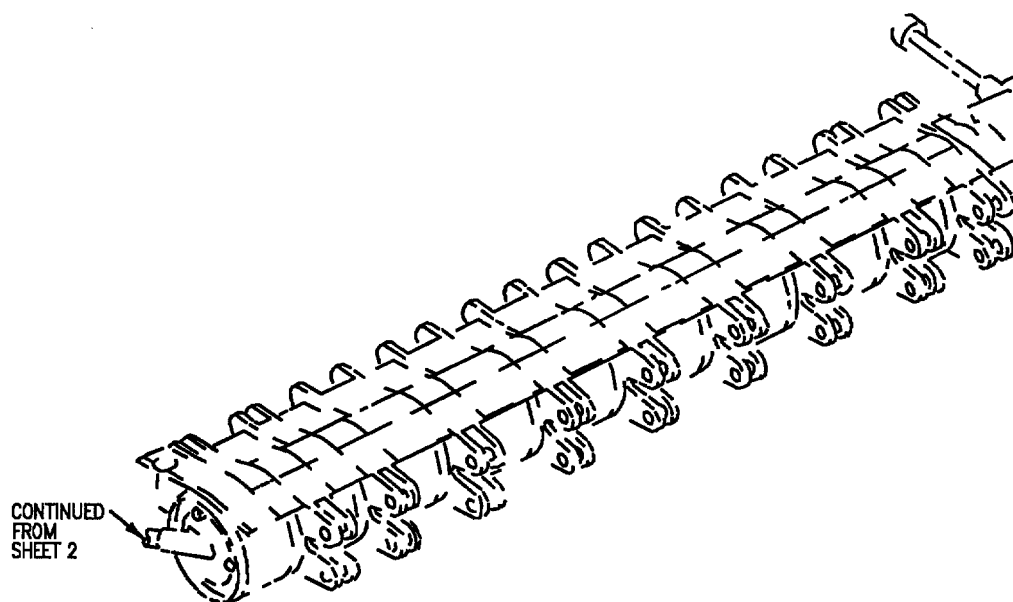
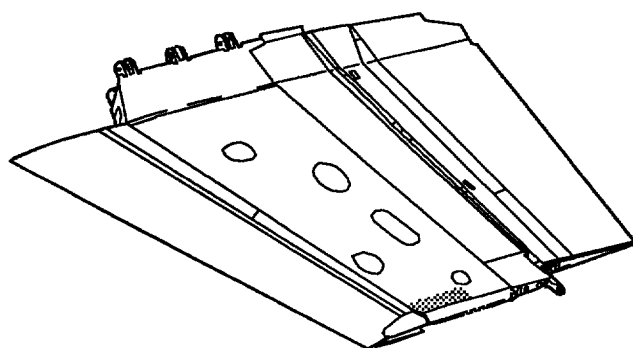


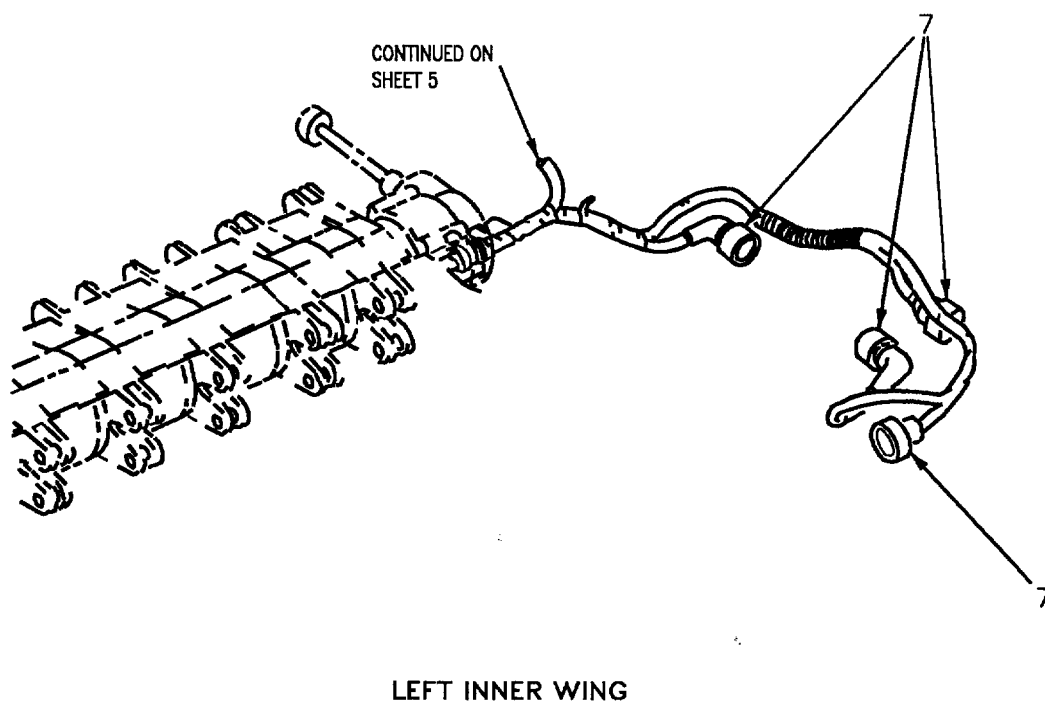
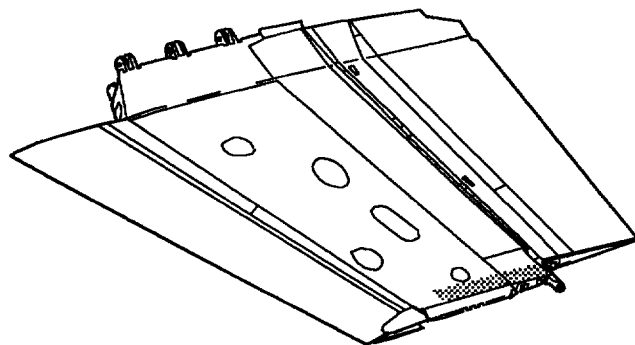
Figure 2. Electrical Component Replacement (Sheet 2)



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FROM
SHEET 2

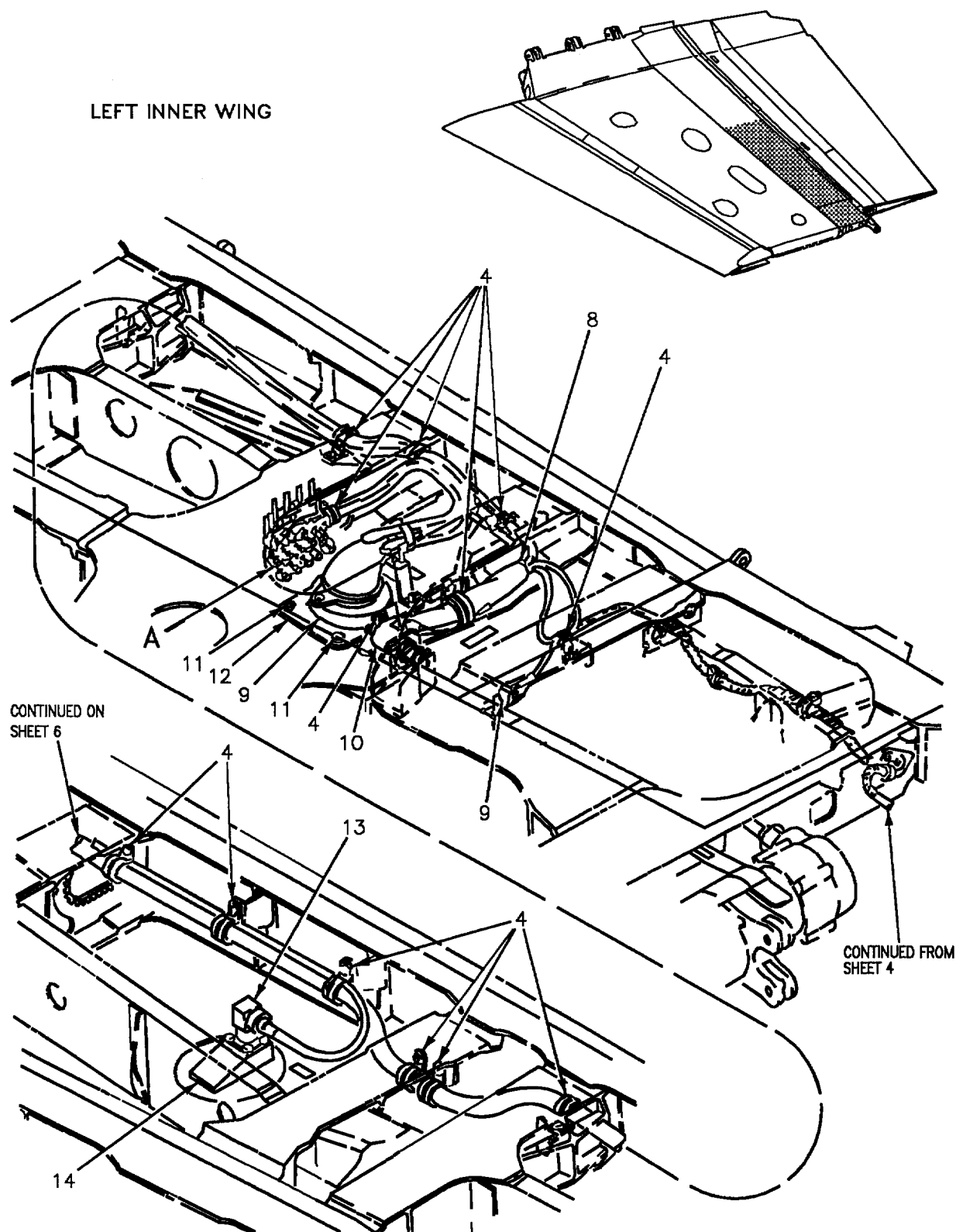
LEFT INNER WING

Figure 2. Electrical Component Replacement (Sheet 3)



LEFT INNER WING

Figure 2. Electrical Component Replacement (Sheet 4)



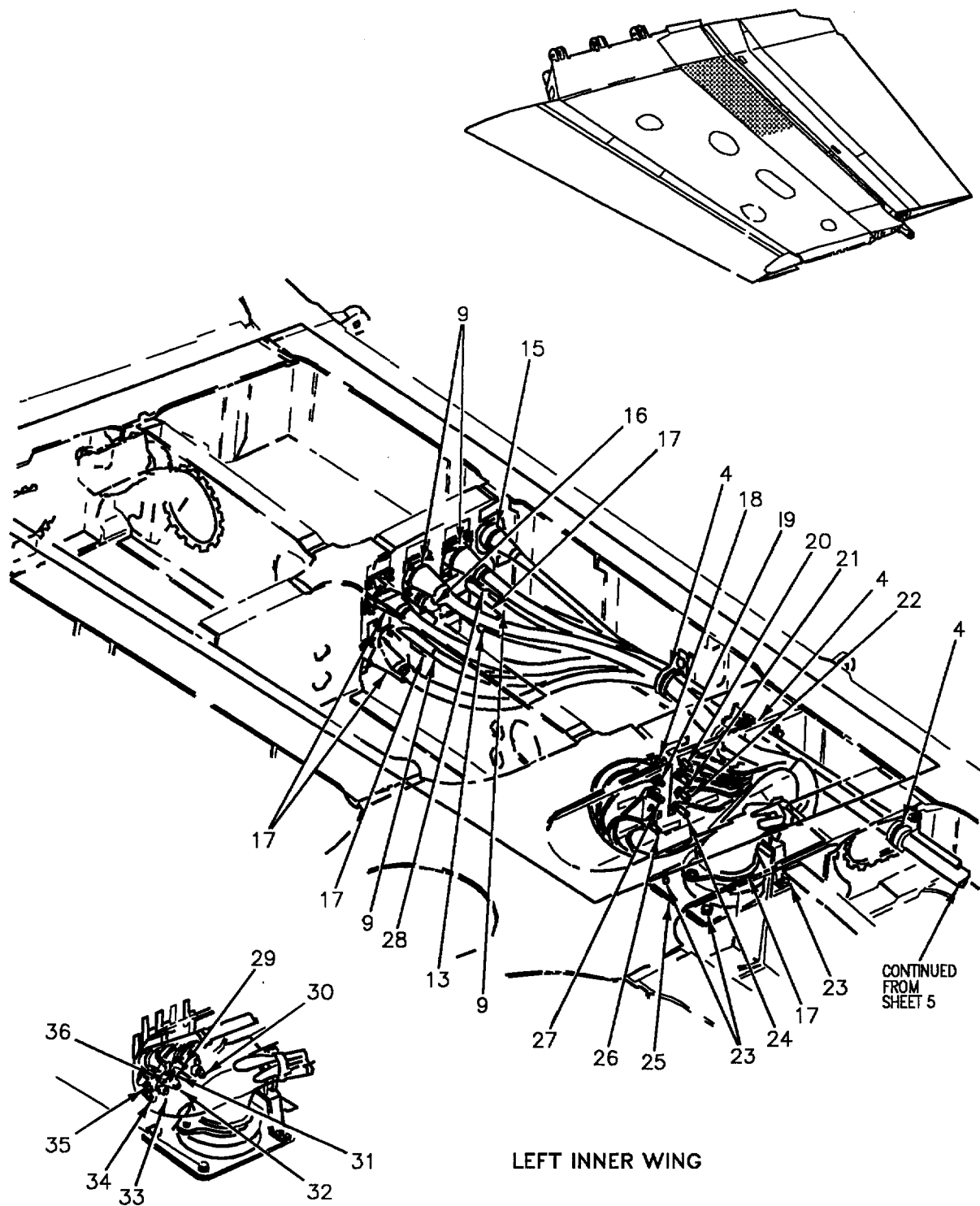
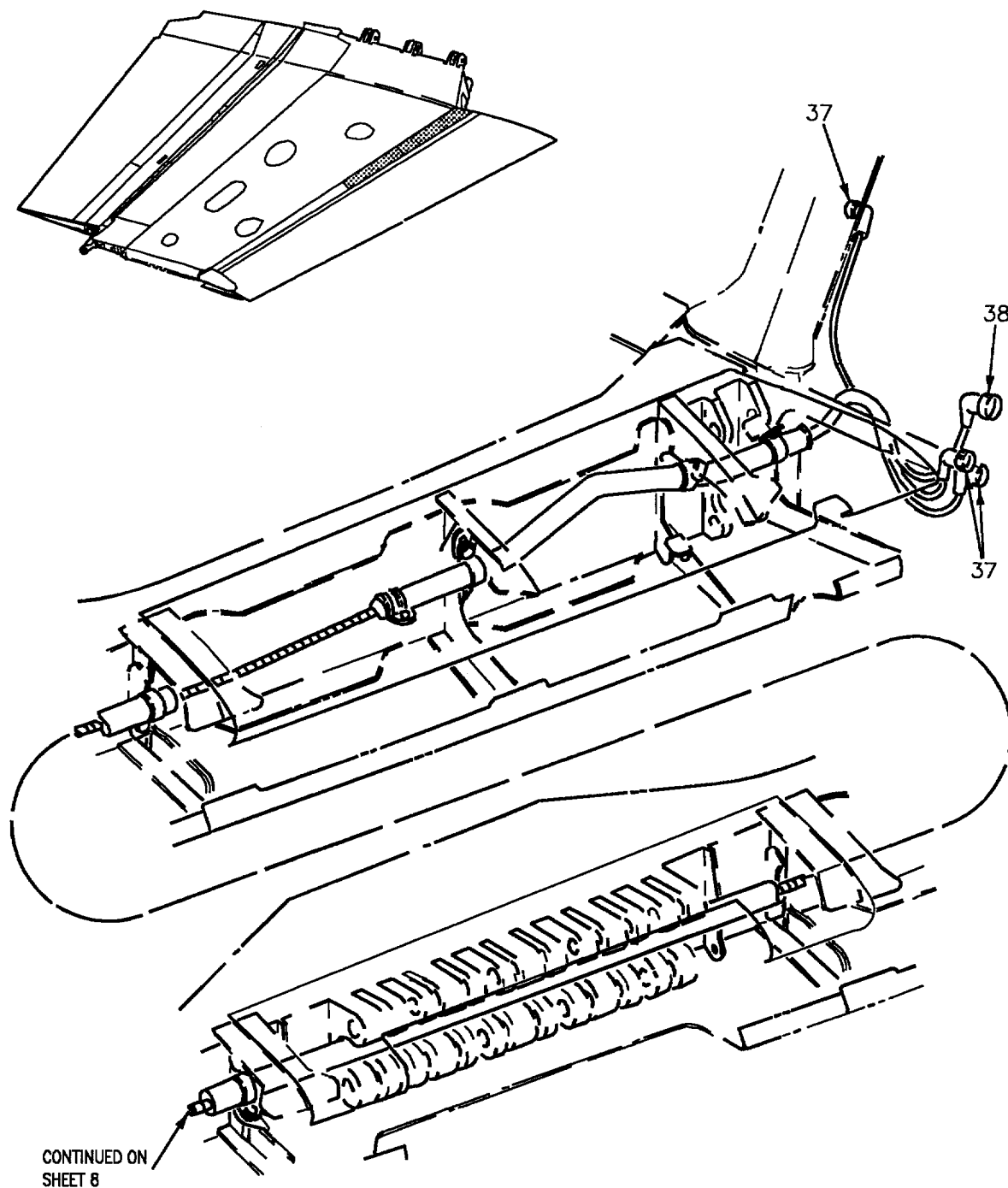


Figure 2. Electrical Component Replacement (Sheet 6)



RIGHT INNER WING

Figure 2. Electrical Component Replacement (Sheet 7)

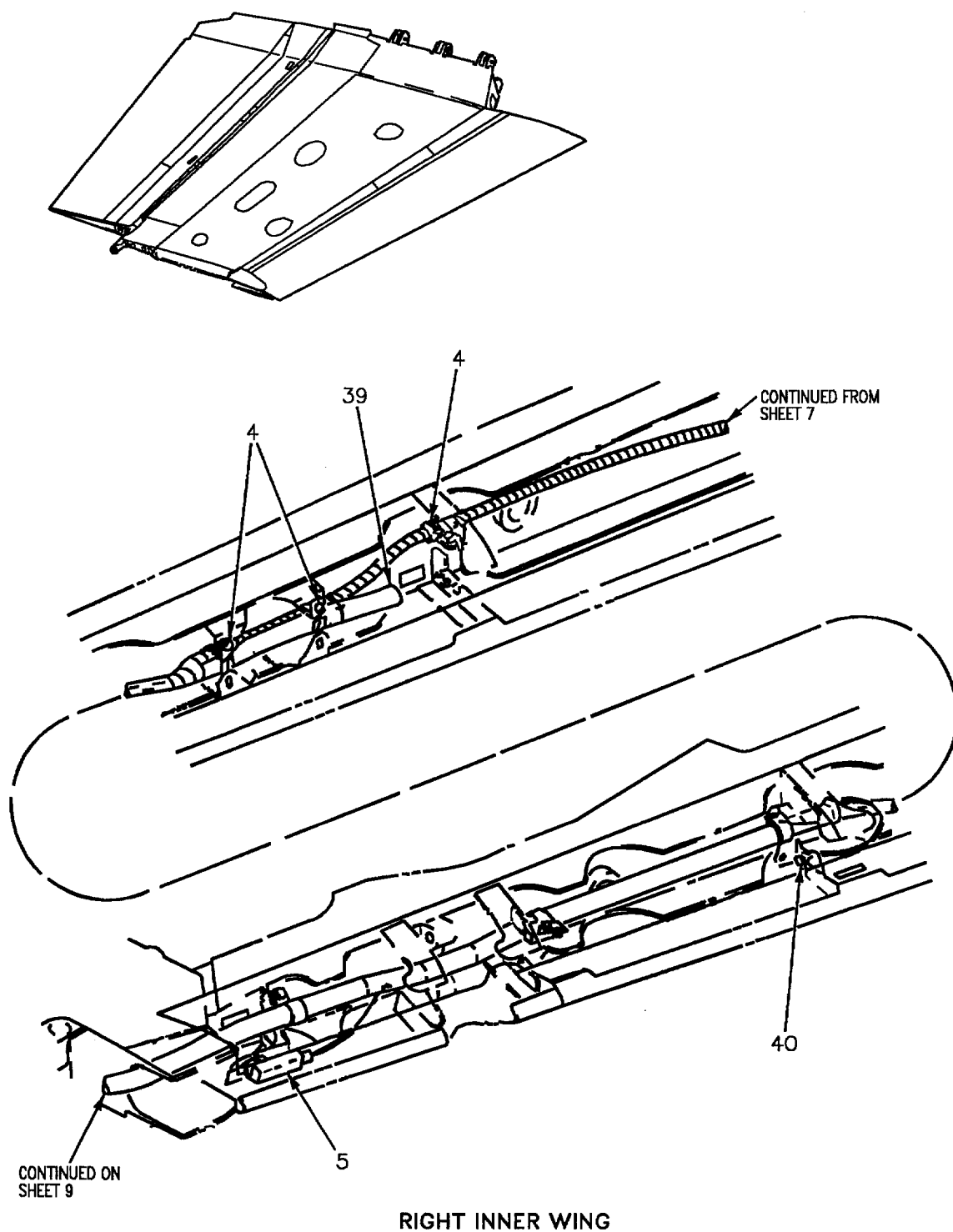
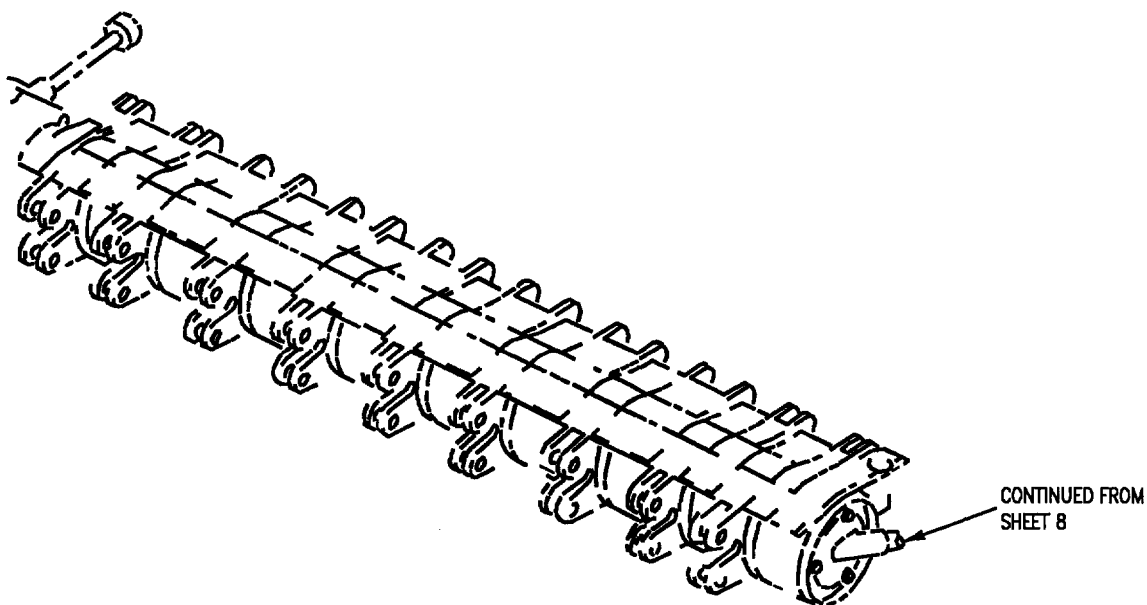
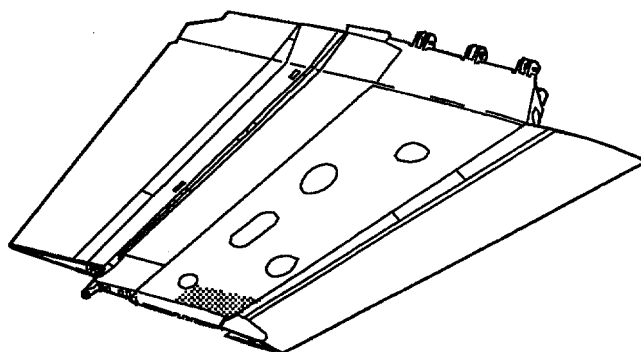


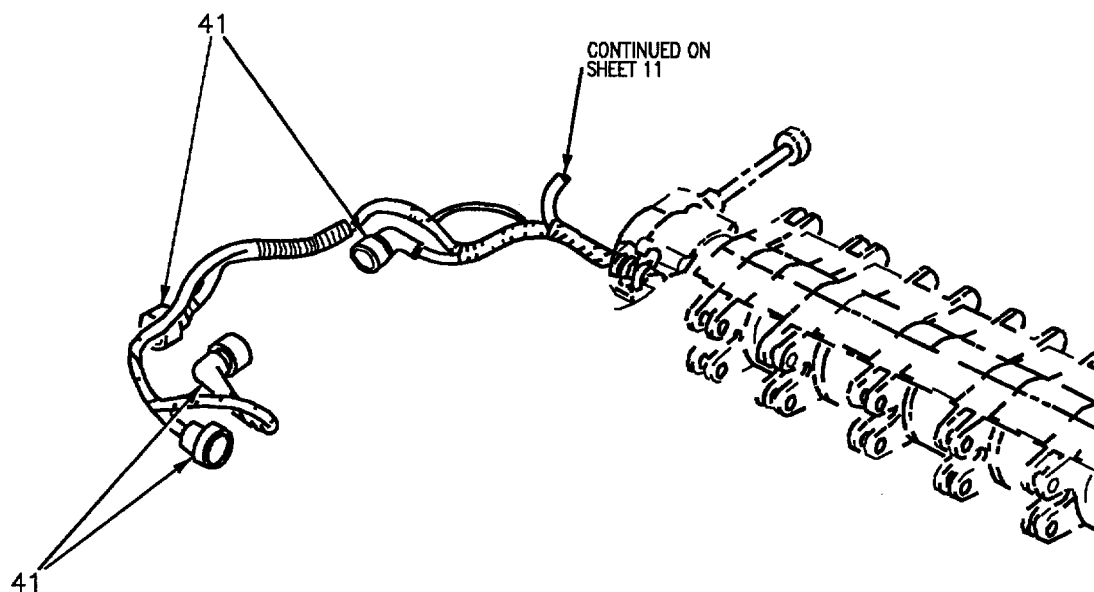
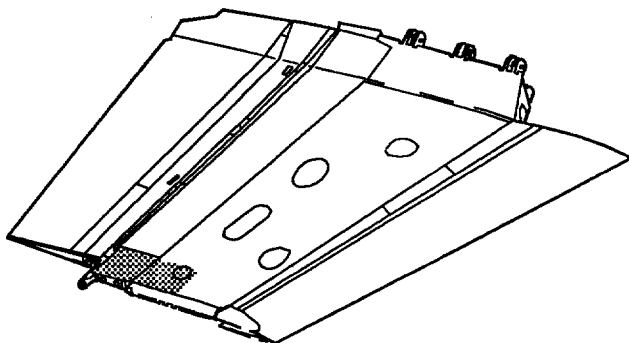
Figure 2. Electrical Component Replacement (Sheet 8)



CONTINUED FROM
SHEET 8

RIGHT INNER WING

Figure 2. Electrical Component Replacement (Sheet 9)



RIGHT INNER WING

Figure 2. Electrical Component Replacement (Sheet 10)

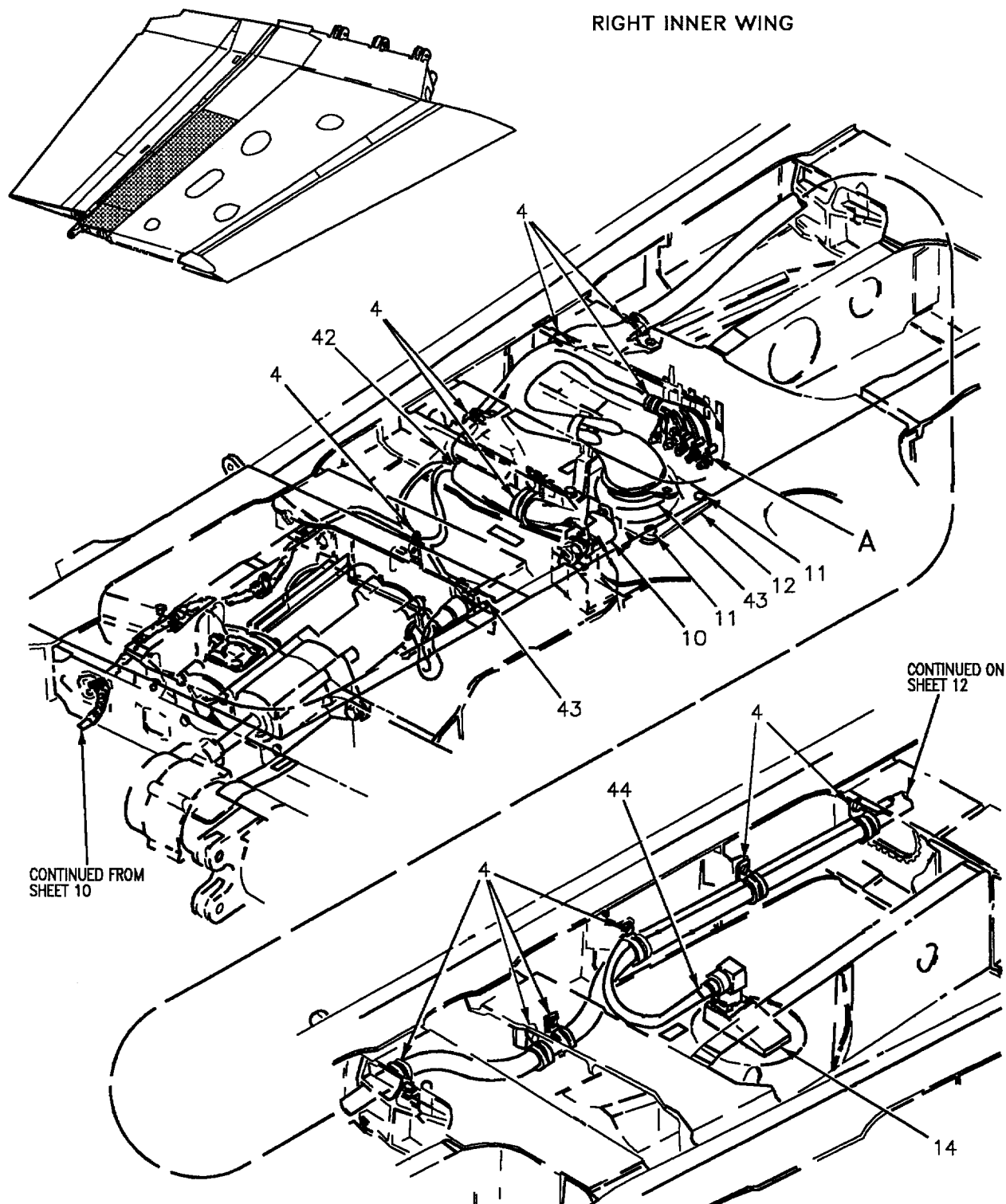


Figure 2. Electrical Component Replacement (Sheet 11)

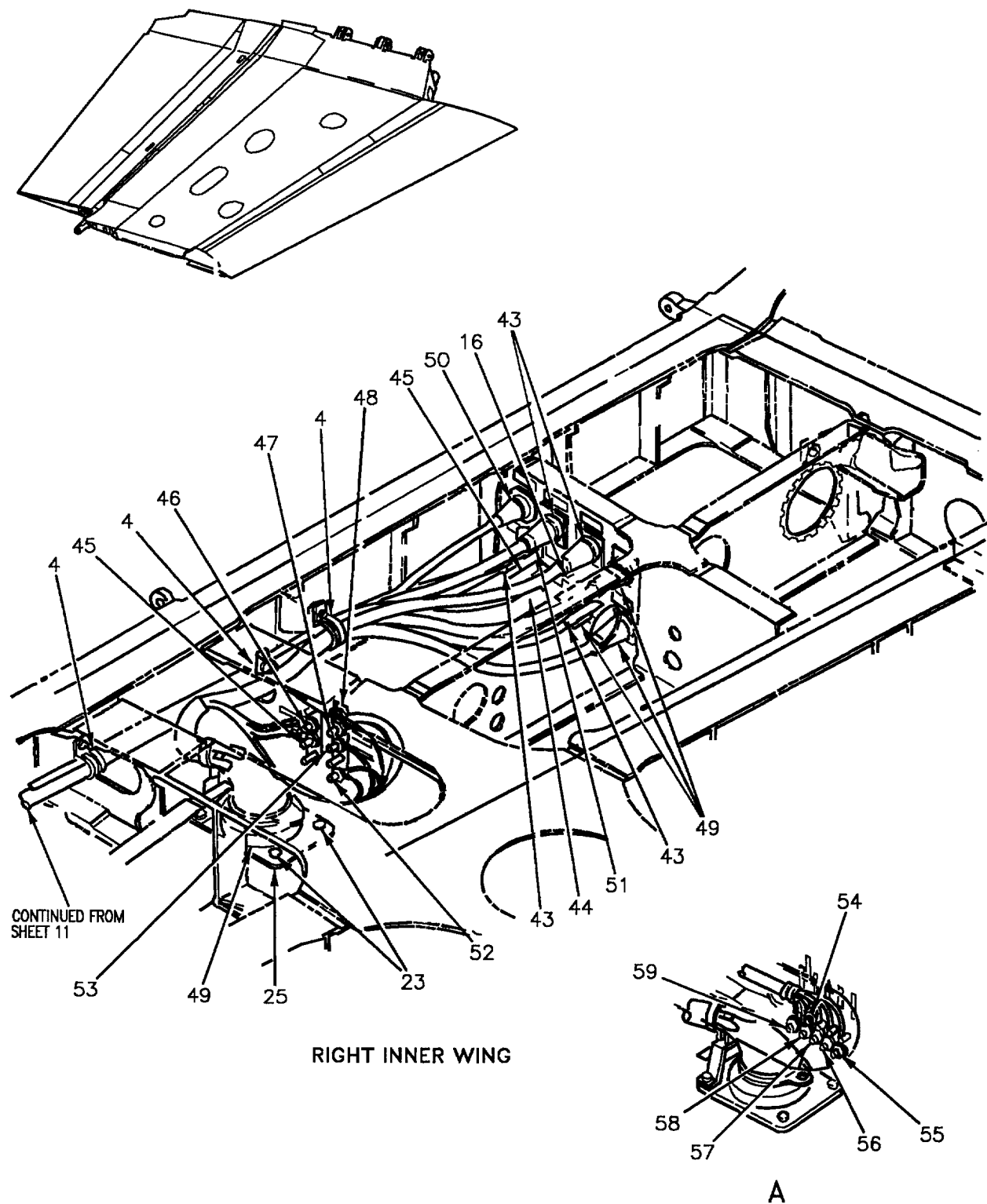


Figure 2. Electrical Component Replacement (Sheet 12)

INDEX	NOMENCLATURE
1	CABLE ASSEMBLY
2	CABLE ASSEMBLY
3	SPLICE
4	CLAMP
5	SWITCH
6	GROUND
7	CABLE ASSEMBLY
8	SPLICE
9	CABLE
10	SWITCH
11	BOLT
12	RECEPTACLE
13	CABLE ASSEMBLY
14	ANTENNA
15	CABLE ASSEMBLY
16	ADAPTER
17	CABLE ASSEMBLY
18	GROUND
19	GROUND
20	GROUND
21	GROUND
22	GROUND
23	BOLT
24	GROUND
25	RECEPTACLE
26	GROUND
27	GROUND
28	CABLE ASSEMBLY
29	GROUND
30	GROUND
31	GROUND
32	GROUND

INDEX	NOMENCLATURE
33	GROUND
34	GROUND
35	GROUND
36	GROUND
37	CABLE ASSEMBLY
38	CABLE ASSEMBLY
39	SPLICE
40	GROUND
41	CABLE ASSEMBLY
42	SPLICE
43	CABLE ASSEMBLY
44	CABLE ASSEMBLY
45	GROUND
46	GROUND
47	GROUND
48	GROUND
49	CABLE ASSEMBLY
50	CABLE ASSEMBLY
51	CABLE ASSEMBLY
52	GROUND
53	GROUND
54	GROUND
55	GROUND
56	GROUND
57	GROUND
58	GROUND
59	GROUND

Figure 2. Electrical Component Replacement (Sheet 13)

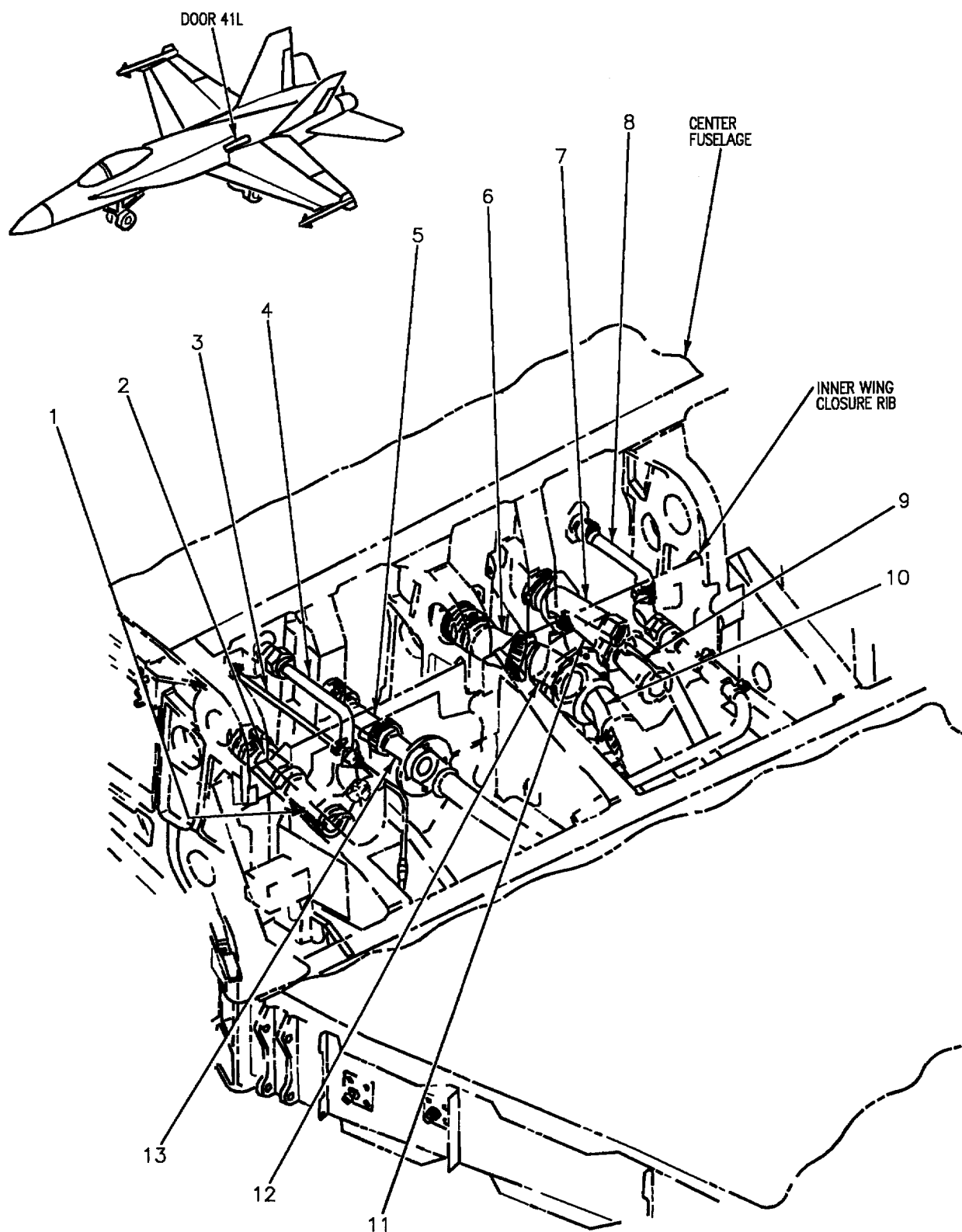


Figure 3. Fuel Component Replacement (Sheet 1)

INDEX	NOMENCLATURE
1	ADAPTER
2	ADAPTER
3	TUBE ASSEMBLY
4	TUBE ASSEMBLY
5	ADAPTER
6	TUBE ASSEMBLY
7	TUBE ASSEMBLY
8	TUBE ASSEMBLY
9	TUBE ASSEMBLY
10	TUBE ASSEMBLY
11	TUBE ASSEMBLY
12	TUBE ASSEMBLY
13	ADAPTER

Figure 3. Fuel Component Replacement (Sheet 2)

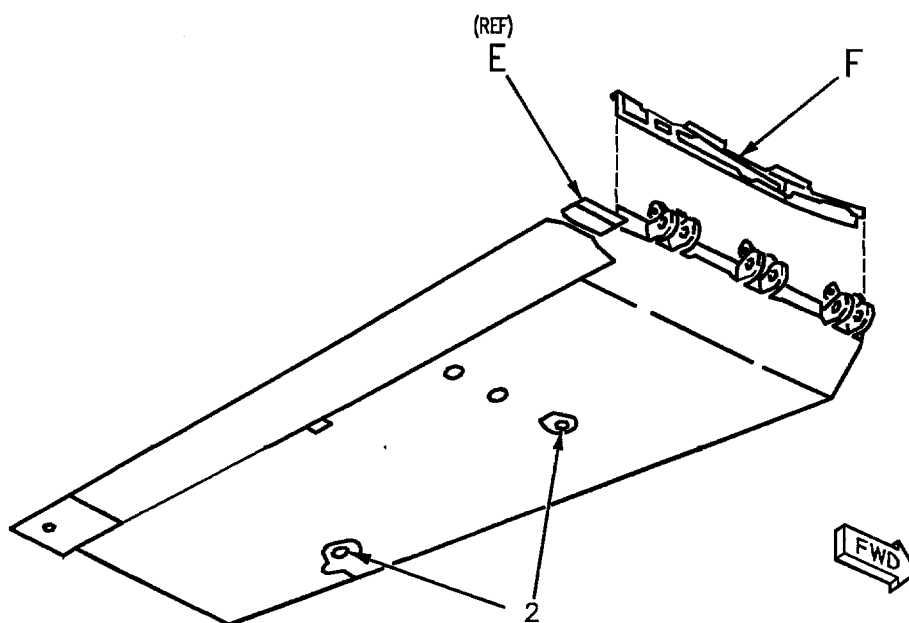
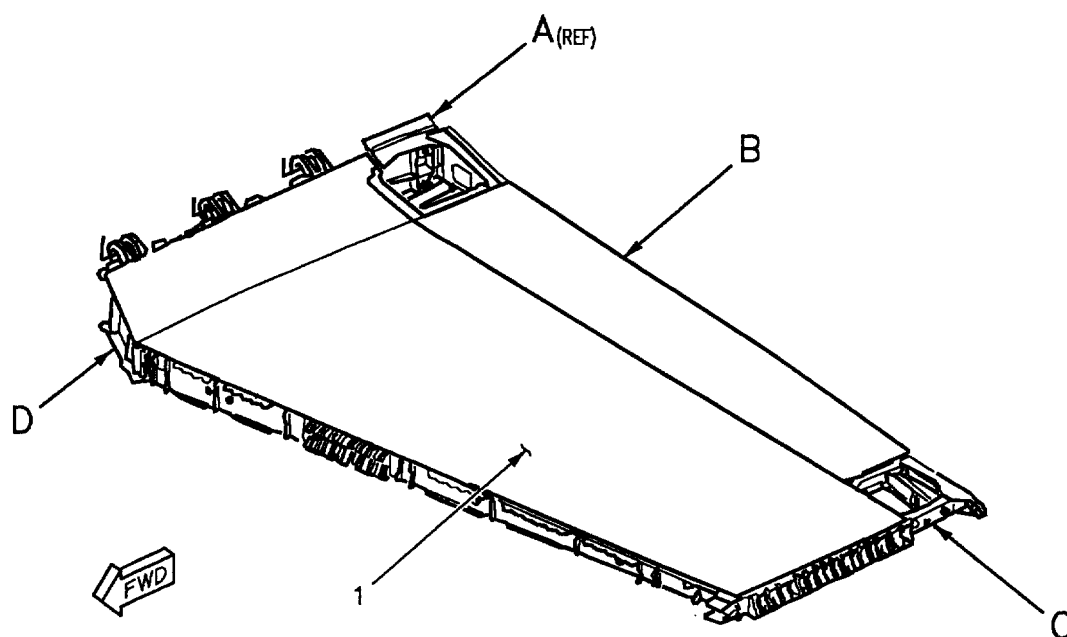


Figure 4. Inner Wing Replacement (Sheet 1)

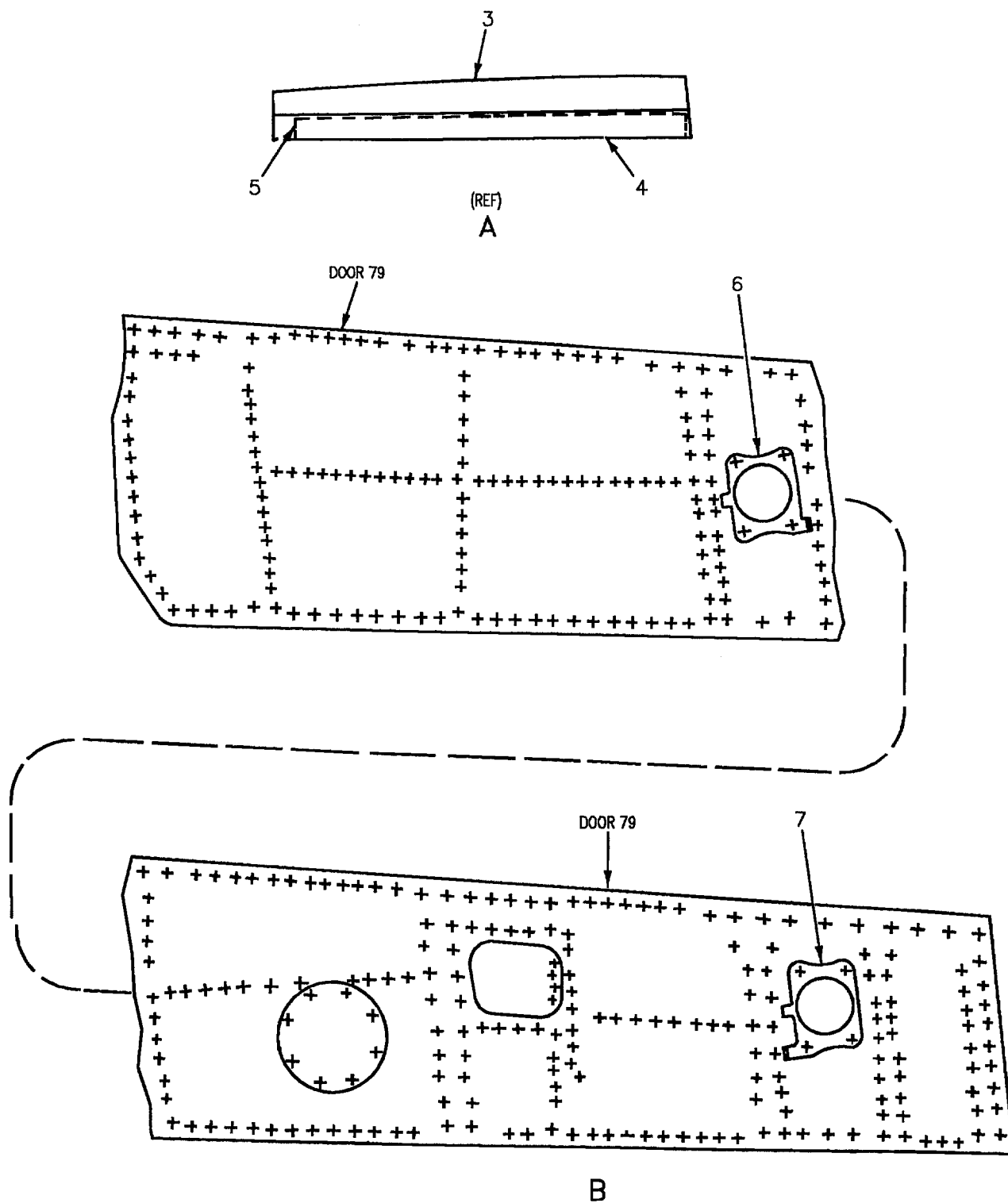


Figure 4. Inner Wing Replacement (Sheet 2)

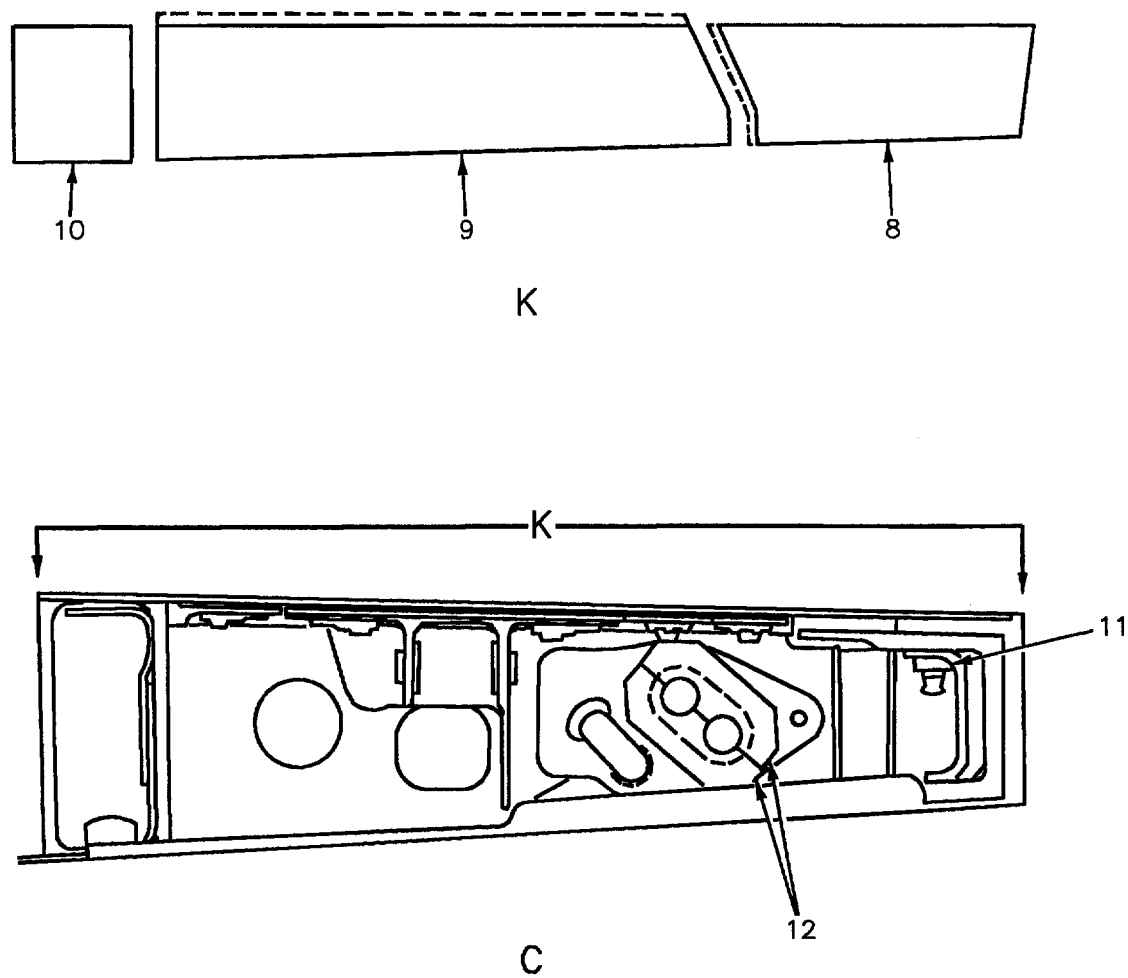


Figure 4. Inner Wing Replacement (Sheet 3)

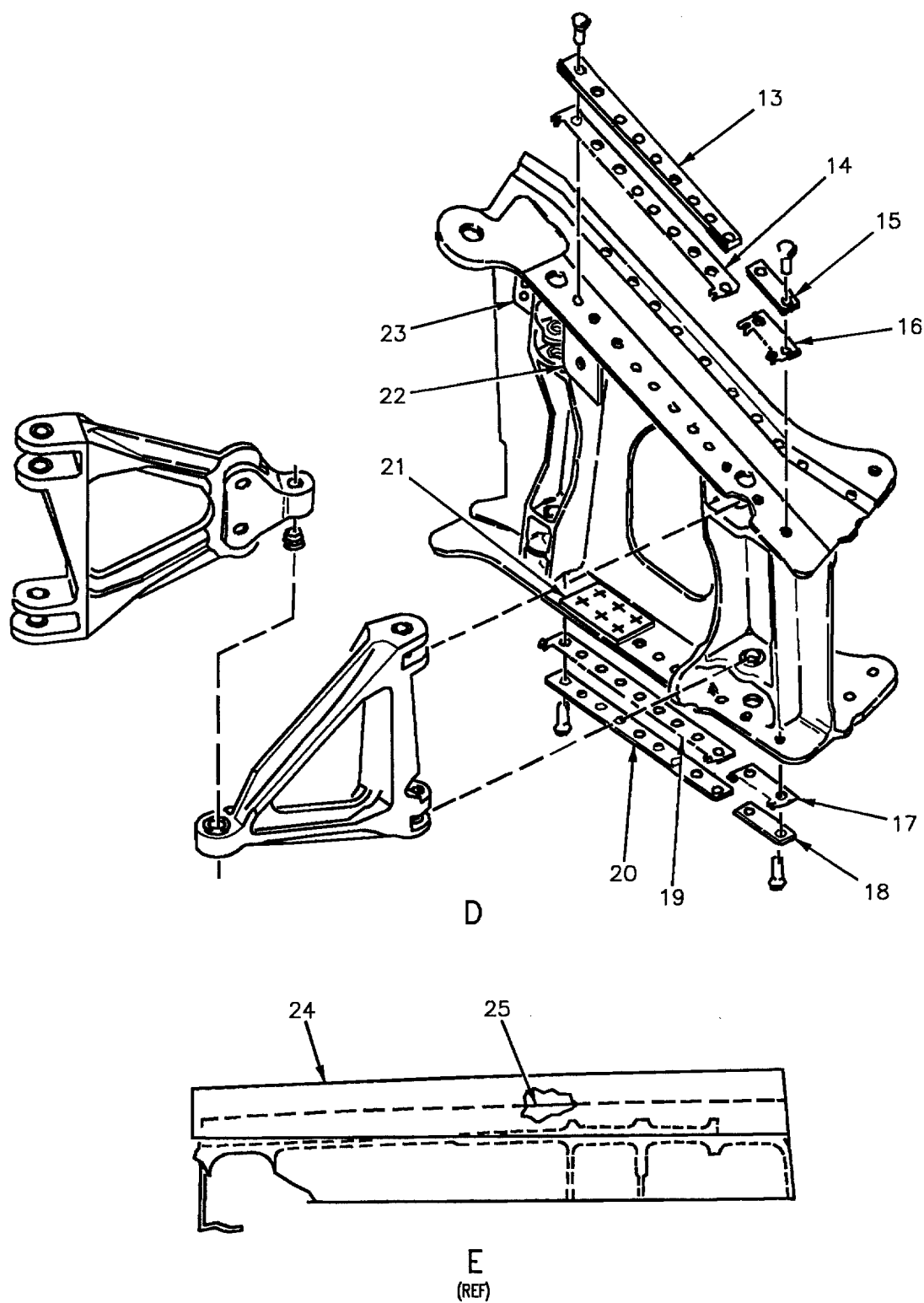


Figure 4. Inner Wing Replacement (Sheet 4)

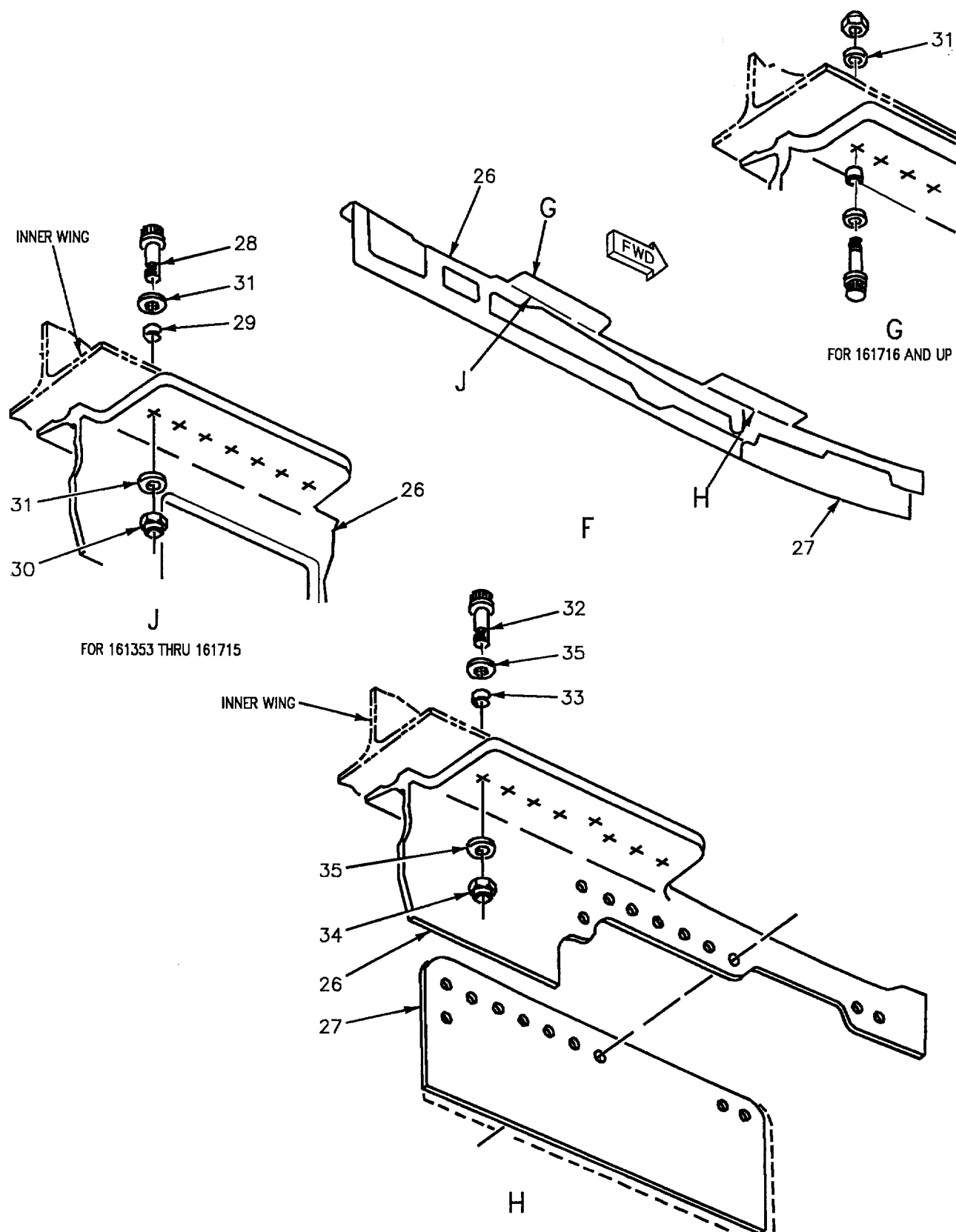







Figure 4. Inner Wing Replacement (Sheet 5)

INDEX	NOMENCLATURE
1	COVER
2	COVER ASSEMBLY
3	 SEAL
4	 RETAINER
5	 SHIM
6	ADAPTER
7	ADAPTER
8	SKIN
9	SKIN
10	SKIN
11	SPACER
12	WELD ASSEMBLY
13	RETAINER
14	BONDING STRIP
15	RETAINER
16	BONDING STRIP
17	BONDING STRIP
18	RETAINER
19	BONDING STRIP

INDEX	NOMENCLATURE
20	RETAINER
21	PLATE
22	BRACKET
23	BRACKET
24	 SEAL
25	 RETAINER
26	DRAG LOAD MEMBER
27	COVER
28	BOLT
29	BUSHING
30	NUT
31	WASHER
32	BOLT
33	BUSHING
34	NUT
35	WASHER

LEGEND

 SEAL RETAINER, AND SHIM INSTALLED PER (WP003 00).

Figure 4. Inner Wing Replacement (Sheet 6)

ORGANIZATIONAL MAINTENANCE

STRUCTURE REPAIR

WING FUEL TANK LEAK DETECTION AND ISOLATION

Reference Material

Structure Repair, Wing	A1-F18AC-SRM-210
Inner Wing Structure	WP004 00
Wing Fuel Tank Fillet and Packing Sealing Procedures	WP018 00
Wing Fuel Tank Dam Gap Seals Repair	WP018 01
Wing Fuel Tank Channel Groove Seal Injection	WP019 00
Fuel System	A1-F18AC-460-300
Line Maintenance Access Doors	A1-F18AC-LMM-010
Aircraft Fuel Cells and Internal/External Tank	NAVAIR 01-1A-35

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Locating Leak Source	6
Leak Isolation	6
Sequence of Repairs	9
Channel Groove Seal Repairs	9
Dam Gap Seal Repairs	9
Fastener Torque and Resealing	9
System Repairs	9
Type of Seals	2
Channel Groove Seal	2
Dam Gap Seal	2
Fillet Seal	2
Packing Seal	2

Record of Applicable Technical Directives

None

1. DESCRIPTION.

2. This work package contains guidelines for detecting the location and isolating the source of a fuel

leak in the wing fuel tank. Several conditions may affect the exit of fuel far from the actual source of the leak. It is important to find the source of the leak to make the correct repair or time and

materials will be wasted and the leak will not be stopped.

3. TYPE OF SEALS.

4. The paragraphs below are for the types of fuel seals in the wing fuel tank. Fuel leaks shall be isolated to the type of seal and repaired per applicable work package. See figure 1.

5. **DAM GAP SEAL.** These seals are cured, flexible sealant located in structural gaps to contain sealant in channel grooves. For dam gap seal repair procedure (WP018 01). See view A.

6. **CHANNEL GROOVE SEAL.** These seals are non-curing, movable sealant located in channel grooves machined into wing fuel tank structure to contain fuel in integral fuel tank. For channel groove seal repair procedures (WP019 00). See view B.

7. **FILLET SEAL.** These seals are a cured sealant, located at structural joints in the interior of wing to contain fuel in integral fuel tank. For fillet seal repair procedure (WP018 00). See view C.

8. **PACKING SEAL.** These seals are O-rings installed on fasteners not located in a channel groove seal. They stop fuel from leaking at skin fastener. For repair of packing seal (WP018 00). See view D.

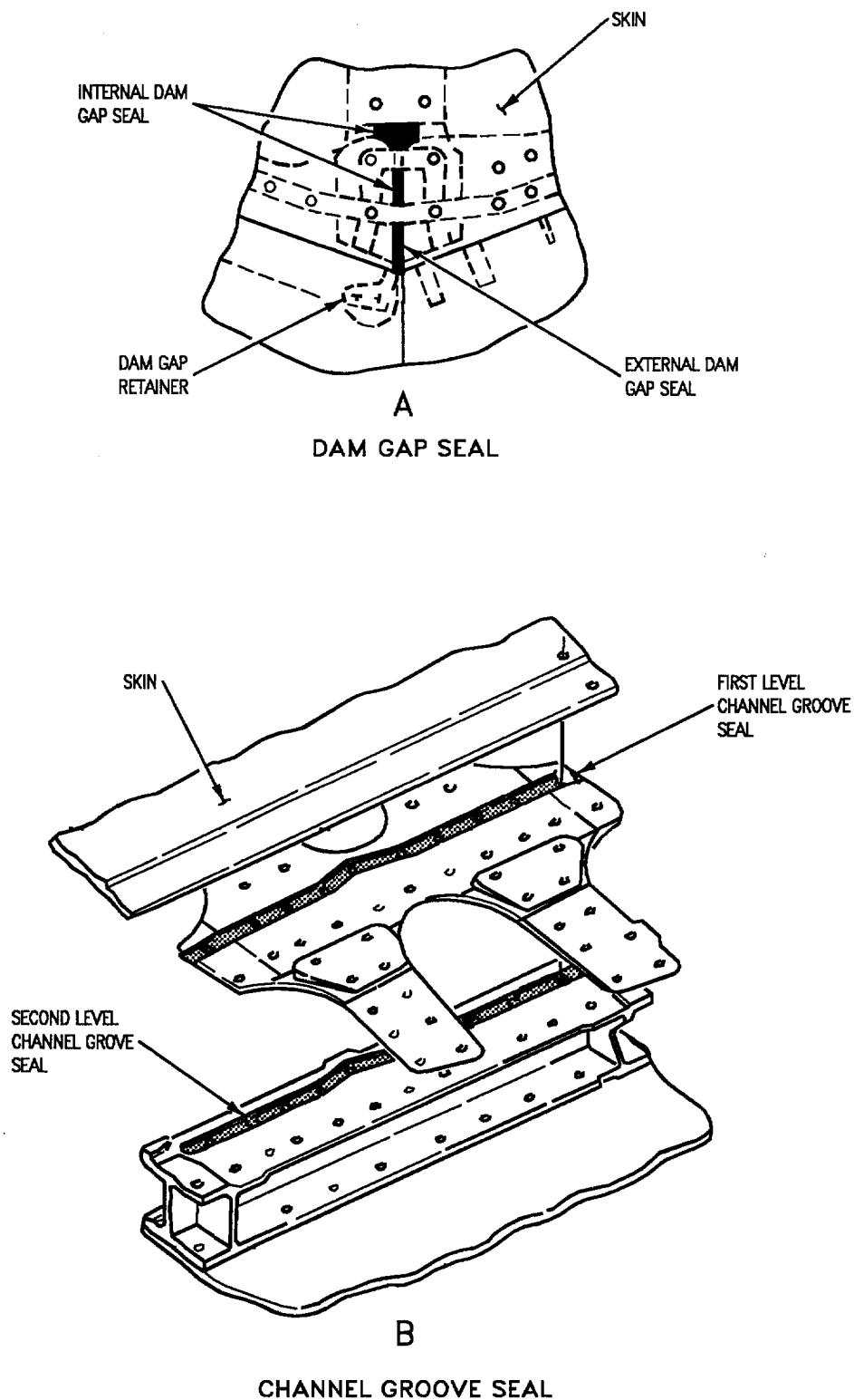
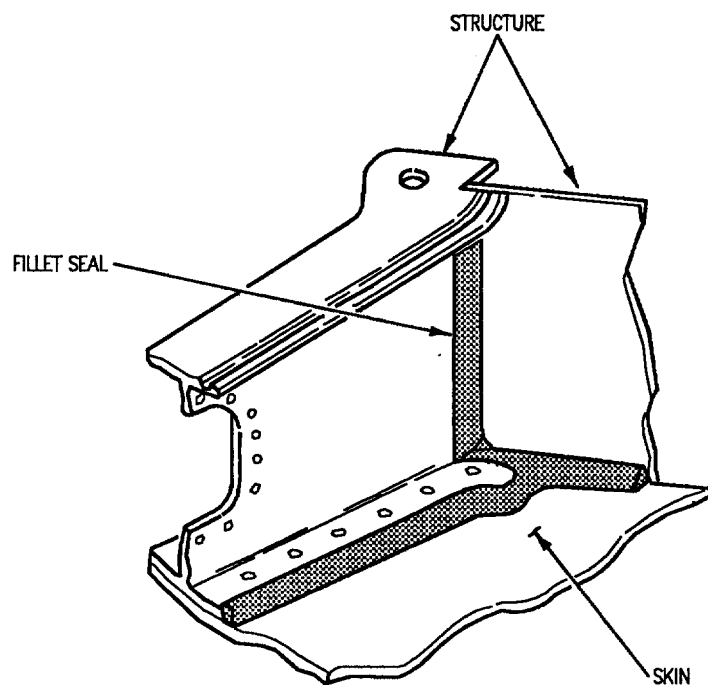
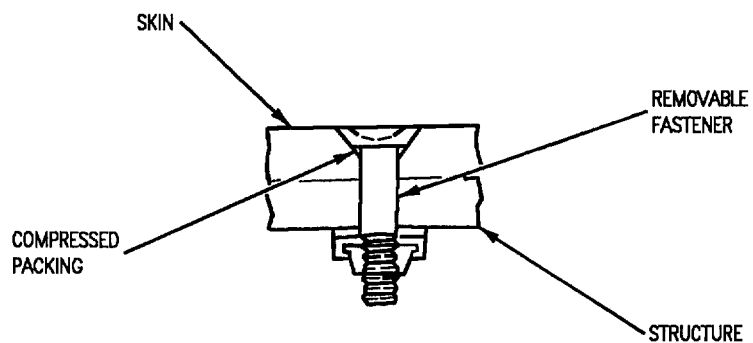


Figure 1. Type of Seals (Sheet 1)



C

FILLET SEAL
(INTERIOR OF WING TANK)



D

PACKING SEAL

FLUSH HEAD FASTENERS INSTALLED THROUGH
SKIN OTHER THAN FASTENERS LOCATED
WITHIN THE CHANNEL GROOVE SEAL

Figure 1. Type of Seals (Sheet 2)

9. CAUSES OF FUEL LEAKS.

10. Some common causes for fuel leaks are below:

- a. Not mixing, storing, and preparing sealant correctly.
- b. Wrong repair or missing true source of leak.
- c. Bad cleaning and preparation of surfaces before application of curing-type sealant.
- d. Fasteners that are installed wrong, damaged or missing.
- e. Wrong application of sealant.
- f. Entrapped air in sealant.
- g. Incomplete curing of sealant before applying pressure.
- h. Fasteners not tightened to correct torque.
- i. Structural cracks, material failures.
- j. Packing seal damage.
- k. Fasteners sealed wrong.
- l. Connections and fittings that pass through fuel tank that are installed wrong, or have bad seals or parts.

11. LEAK DETECTION.

12. The paragraphs below are for locating a leak at its source from its exit point. Leaks can channel through structure and exit far from its source, making detection a difficult but important procedure to do. See figure 2.

Support Equipment Required

None

Materials Required

Nomenclature	Specification or Part Number
Aircraft Marking Pencil	MIL-P-83953, Type 1, Class A, Black
Kraft Paper	A-A-203
Rymple Cloth	AMS-3819

13. **LOCATING LEAK EXIT POINT.** Leaking fuel may stain the lower skin in a much larger area than the actual leak. The steps below are ways to find the actual exit point.

NOTE

To make best evaluation of location and size of fuel leak, inspect the leak while tank is fueled.

14. Flashlight Method.



Jet Fuel



21

- a. Wipe leak area dry using clean dry rymple cloth.
- b. Blow out all joints and corners with compressed air. Wipe any remaining fuel off of wing with rymple cloth.
- c. Shine flashlight on dried area.
- d. Observe lighted area very closely for several minutes.
- e. When fuel exits the skin, the fluid will refract the light, making it easy to find.
- f. Mark exit point with pencil.
- g. Continue leak detection procedure.

15. Torn Paper Method.



Jet Fuel



21

- a. Wipe leak area dry using clean, dry cheesecloth.

b. Blow out all joints and corners with compressed air. Wipe any remaining fuel off wing with cheesecloth.

c. Tear paper to get a ragged, fuzzy edge.

d. Slowly move torn edge along dried leak area.

e. Paper edge will absorb any fuel exiting the skin indicating the leak exit point.

f. Mark exit point with pencil.

g. Continue leak detection procedure.

16. LEAK PATH ANALYSIS. To locate the exact leak source from the leak exit, the path the fuel takes must be determined. The leak path could be a short leak path of a single fastener, leaks across the channel groove seal, or could travel many feet through wing tank structure before exiting. Refer to applicable work packages for assistance in analyzing the leak path.

a. Remove doors or covers in area of leak for visual inspection (A1-F18AC-LMM-010).

b. Compare leak pattern with internal structure assembly (WP004 00).

c. Check for wing fuel tank sealing locations: Fasteners (WP018 00), Dam Gap Seals (WP018 01), Channel Groove Seals (WP019 00).

17. LOCATING LEAK SOURCE. The leak source is the exact location of the seal, connection, or structure failure that is leaking. It is most important to find the

true source of a leak to make the correct and effective repairs. Methods for finding leak source are below.

a. Check wing fuel tank sealing procedures for failed fasteners (WP018 00), dam gap seal (WP018 01), or channel groove seal (WP019 00).

b. Inspect for fuel system connection leaks (A1-F18AC-460-300).

18. Use of Dye Method. This method identifies hidden leak sources, and at times the leak path, by coloring fuel with dye and visually inspecting for leak sources.

a. Locate leak source by use of dye in fuel tank (NAVAIR 01-1A-35).

19. LEAK ISOLATION.

20. To effectively repair a leak, the leak must be isolated to the exact fastener, channel groove seal, dam gap seal, or component that is leaking.

a. Isolate the leak. Refer to applicable work package for location and type of seal leak:

(1) Injection fasteners, first and/or second level channel groove seal (WP019 00).

(2) Removable fasteners, internal tank fillet seals (WP018 00).

(3) Dam gap seals (WP018 01).

(4) Fuel system components and connections (A1-F18AC-460-300).

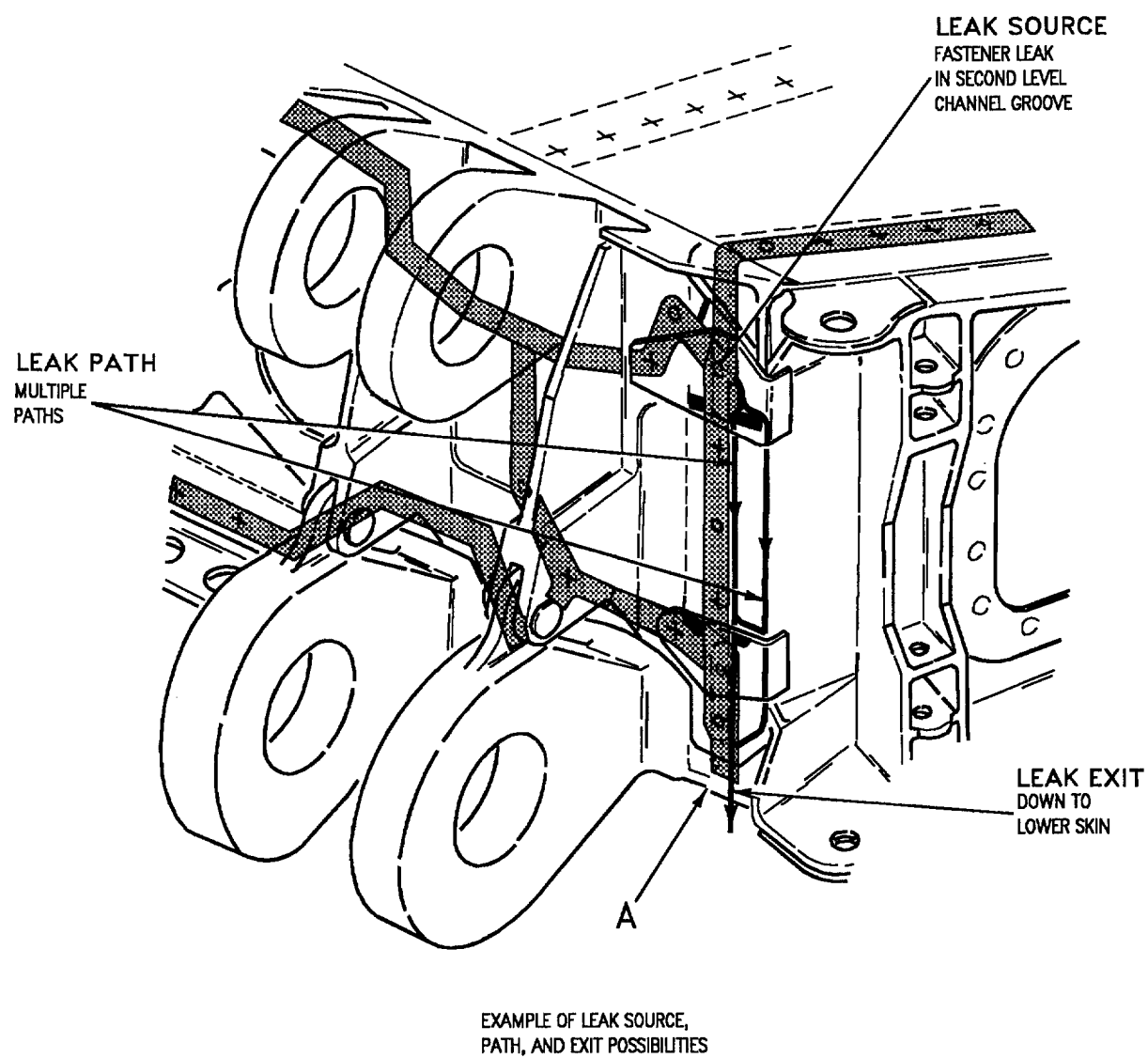


Figure 2. Leak Detection (Sheet 1)

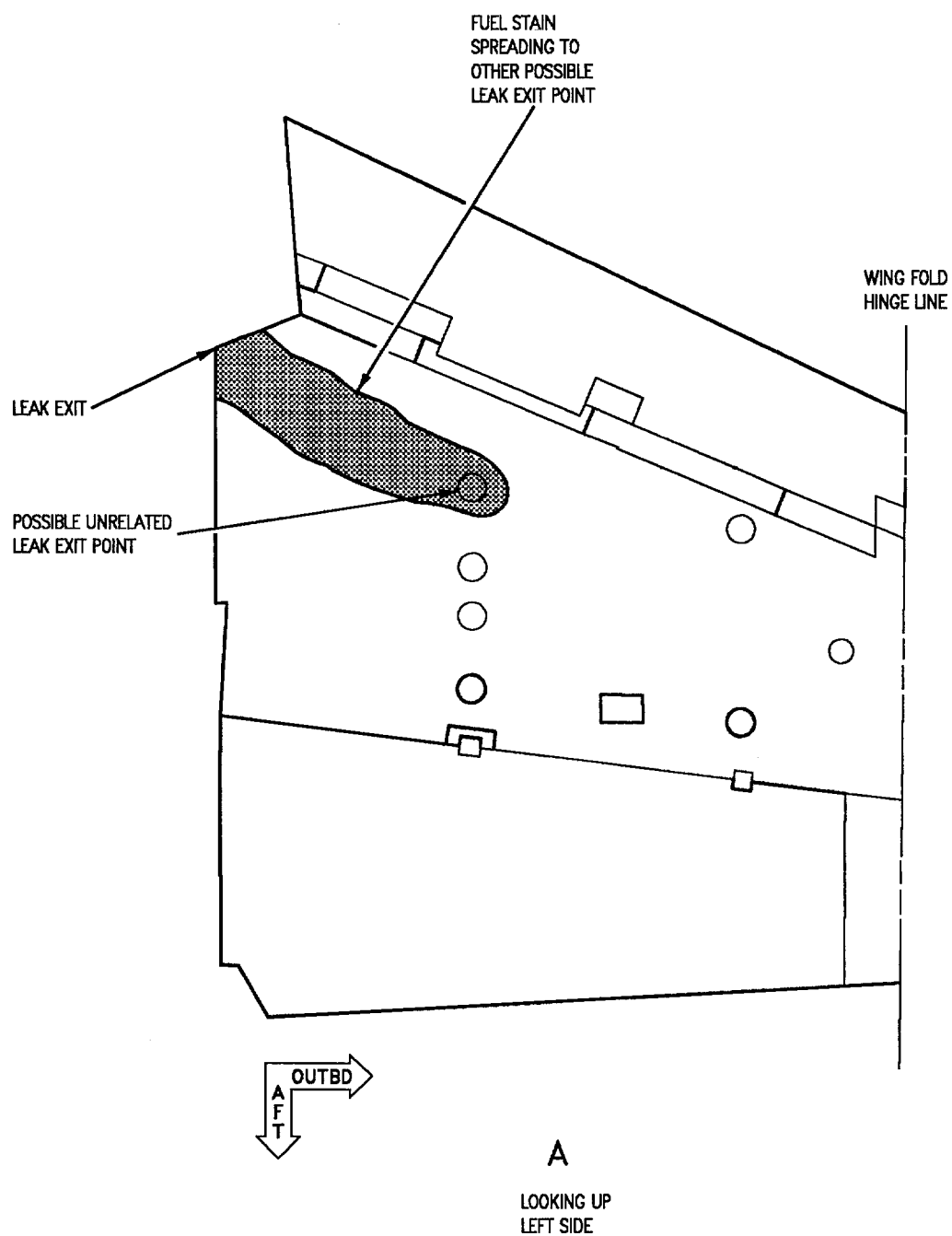


Figure 2. Leak Detection (Sheet 2)

21. SEQUENCE OF REPAIRS.

22. All repairs shall be made per applicable work packages. The correct sequence of repairs will save time and unrequired repairs by sealing for leaks at most probable source first and logically progressing through other seal repair methods. The paragraphs below are logical sequence of repairs.

23. **SYSTEM REPAIRS.** Evaluation and repair of fuel system shall be done before repair of seals.

a. For fuel system maintenance
(A1-F18AC-460-300).

24. **FASTENER TORQUE AND RESEALING.** Channel groove seal leaks may be stopped with retightening fasteners.

a. Inspect fasteners in area of leak for correct torque and skin clamp-up (WP018 00).

b. Repair any failed fastener packings (WP018 00).

25. **CHANNEL GROOVE SEAL REPAIRS.** Channel groove seal repair will reseal skin to structure, structure to structure, and fasteners in the channel groove.

a. Reseal channel groove seal in area of leak (WP019 00).

26. **DAM GAP SEAL REPAIRS.** Dam gap seals shall be repaired after all other methods of sealing have been tried.

a. Repair dam gap seals in area of leak (WP018 01).

